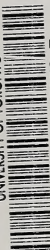


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ALCOHOL AND CRIMES OF VIOLENCE

by Kai Pernanen

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by Kai Pernanen

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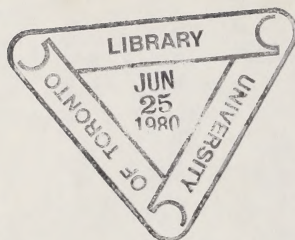
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# ALCOHOL AND CRIMES OF VIOLENCE

Kai Pernanen<sup>+</sup>

## I. INTRODUCTION

The first problem encountered in trying to analyse the relationship between alcohol use and crimes of violence is in the choice of a theoretical context. One possibility is to look at violent crime as a subset of deviant behavior and put it in this theoretical sociological context, (if one such is possible). On the other hand, one could look at it from the viewpoint of aggressive behavior in general and see violent crimes as a sample of such behavior, a sample biased in favor of extreme forms of aggressive behavior. I have chosen the latter approach since a framework limited to sociological variables would leave out central explanatory factors which are not relevant on the aggregate sociological level of analysis. Much of the empirical and theoretical outcomes of research on deviance are applicable in the explanations, but the emphasis will be on the connections with research on aggressive behavior. The relevant sociological factors will be seen only as one set of variables in an explanatory framework that encompasses (and must encompass) research findings from several disciplines.

This chapter has been divided into two main sections. The first one reviews the evidence for a higher-than-chance

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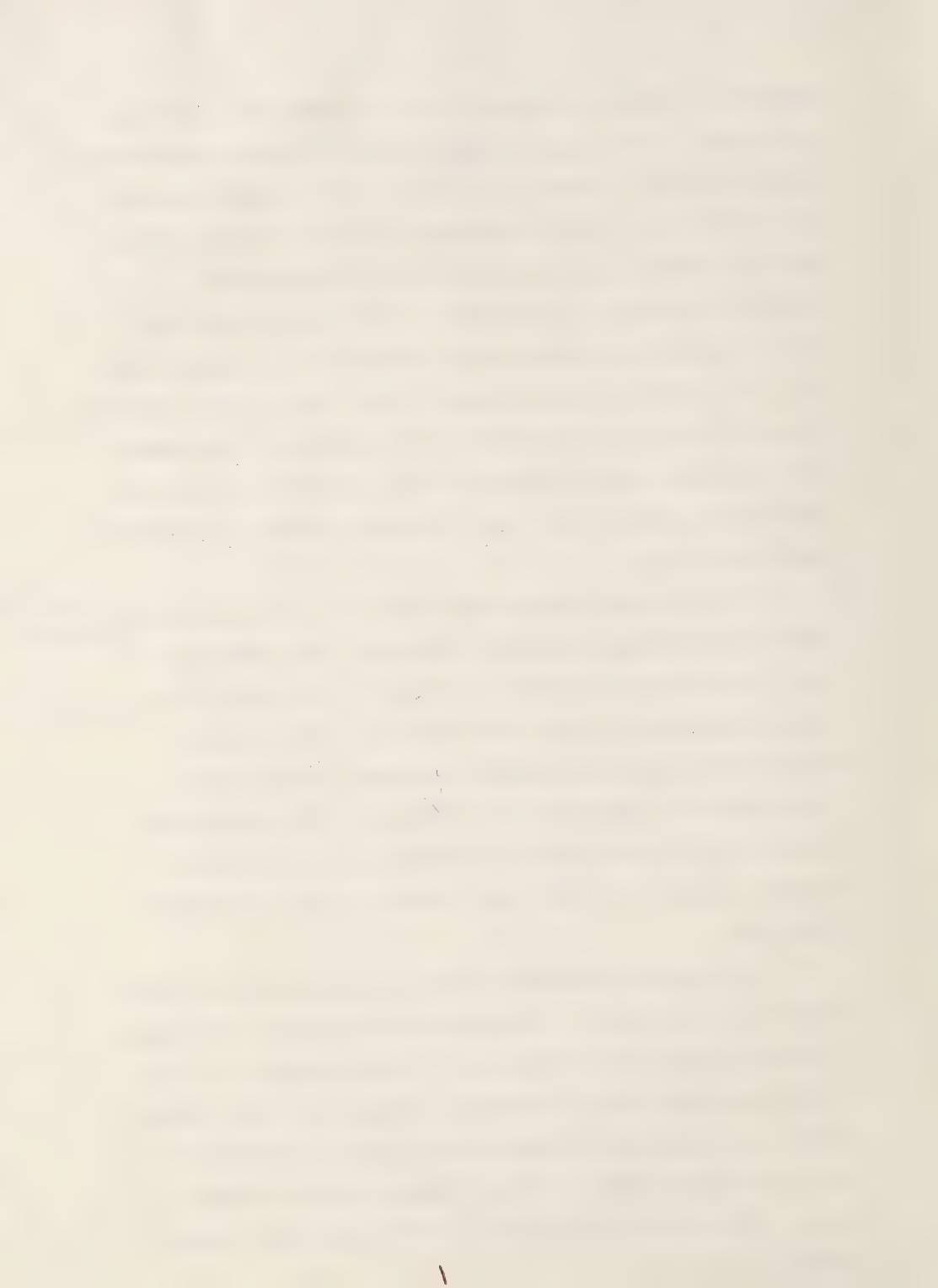


association between alcohol use and alcoholism and violent crime. The second section deals with possible explanatory factors and models which would account for a positive association between the two phenomena. The task is not simple. Gaps in coverage are inevitable and idiosyncratic, selective emphases unavoidable. This is probably true of any attempt at synthesizing knowledge in a complex area, but it is perhaps more pronounced when some of the relevant fields of study are unfamiliar to the author. The reason for undertaking such a task is that, in my view, only an exhaustive approach can lead to a satisfactory explanation of a phenomenon.

I will almost exclusively deal with non-instrumental and interindividual crimes of violence. The emphasis will be on homicide, partly because it is an easily definable category of crime and thus there is the least possible definitional variation between cultures and jurisdictions. Homicides are definitely interindividual. A proportion of homicides are however, instrumental for various reasons and thus one criterion is not optimally fulfilled.

*to deal with*

Instrumental homicides include murders and homicides which have occurred in connection with robberies and rapes, although situational factors such as the reaction of the victim may have led to immediate reactions in the offender which from the point of view of his original intentions were non-instrumental. (These remarks should be seen in the light of the discussion of the escalatory process below).



However, the criterion of non-instrumentality has served to exclude some existing scattered data on the involvement of alcohol in robberies and rapes which are interpersonal but more instrumental with a higher degree of rational planning. They are thus often determined by extrasituational factors to a greater extent than most homicides and assaults.

Assaults are probably the most non-instrumental category of violent crimes. If assaultive acts are committed in connection with a robbery they will probably be subsumed under "robberies", if they are part of a rational attempt to kill for instrumental gains, it is likely that a large proportion will be classified under "attempted murder", and if committed in connection with rape they will probably be classified as "rapes". Unfortunately, very few studies have been made on alcohol involvement in assaults, although the greater prevalence of assaults would provide data for more extensive analyses of the role of alcohol in violent behavior than is possible with homicides. The ideal study from this point of view would include assaults and non-instrumental homicides from the same jurisdiction. This is so also because it is often more or less a question of chance circumstances whether a violent act ends up as an aggravated assault or a homicide (and the nomothetic etiological factors are the same). The escalatory process of violent behavior can be cut off by outside inter-

7 only  
few  
studies





vention and chance circumstances often determine whether lethal weapons are available in the situation, the ambulance arrives on time, etc., (see section on the nature of the dependent variable below).

Arson and vandalism are excluded from detailed study since they are not interpersonal in nature, and explanations of these would differ in important respects from explanations of interpersonal crimes. If robbery, rape and arson were included just because they are classified as violent crimes for non-scientific purposes, the explanatory accounting would have been extremely complex and more often misleading than not. The alcohol involvement in rape, child molesting, and arson seems to be much lower than for homicide and other purely assaultive crimes, which is another indication of the different weights of etiological factors in explaining these crimes. The definition and reporting of rape is also extremely sensitive to cultural, temporal, and jurisdictional variations. Moreover, alcohol use and concomitant factors may influence the reporting of rapes in a selective and biasing way, especially since it is estimated that a very small proportion of sexual assaults which could be classified as rapes are ever reported to the authorities. The ones that are reported are probably biased against the role of alcohol in the cases where the rape victim has been drinking. The alcohol involvement (i.e., the proportion of cases in which either offender or victim or both were "under the influence"





of alcohol) has a median of between one fifth and one third in the more representative studies (Amir, 1967). In child molesting cases alcohol use by the offender has been implicated in between 20 and 30 percent of the cases (e.g., McCaghy, 1968; Nau, 1967). In arson there are very few studies of alcohol involvement available, but the indication is that alcohol is implicated in only about 10 to 20 percent of the offenders (e.g., Aleksic and Radovanovic, 1967; Gelfand, 1971). The alcohol involvement of the offender in robberies seems to be comparatively high (Shupe, 1954; Stark, 1969). The probability of being victimised in robberies is also comparatively high for individuals who have been drinking.

Suicides have sometimes been treated within the same explanatory models as homicides presumably on the basis of common etiological factors. According to the criteria used here for delimiting an empirically and theoretically fruitful field of study, suicides will have to be excluded from our analyses. The extent to which suicides are instrumental or non-instrumental should be of central theoretical concern but is not relevant here, since the deciding factor is that suicides are not interpersonal in the sense used here. The sense in which they are violent or aggressive is not quite clear either. Classifying suicides as aggressive acts seems to hinge very much on psychoanalytic theory of the motivation of these acts. Possibly the identity criteria for using the aggregate of homicide/suicide as one dependent variable, as in



many other classifications in the social sciences, are located in the connotations of everyday language. One "destroys", "does violence to" human beings (either oneself or others) or physical objects. In interpersonal violence the criteria are rather clear: a conscious willful harm to another person. Regarding suicide (and suicidal attempts or self-mutilation), this definition is presumably easily transformed by substitution into: a conscious willful harm to oneself. It seems to be a question of simple logical substitution. The easiness with which the mental substitution is made is probably explained by the fact that such substitution is unproblematic in other contexts and inferences, which in our thinking become paradigms of reasoning even outside their proper domains. It should be remembered that the etiology can be very different in complex ways, despite the ease of linguistic substitutions which guide our thinking.

Other identity criteria that have been used include the presumed motivations of, or causes "within", the offender. I have used motivational criteria of identity to set aside robberies and rapes from (most) homicides and assaults among crimes of violence. Implicit in this is the assumption that motivations are etiologically relevant and that differences in motivations would lead to different explanations. Motivational or causative criteria probably also explain some of the attempts to classify suicide and homicide together.

As with any human act the explanation of acts classified as "violent behavior" is complicated by the fact that they can be seen as a means to a variety of end results. Thus, looking for criteria among motivational states inevitably leads to postulating





a great number of motivational states (as happened with "instincts"), either conscious or subconscious; conversely these criteria can be rendered so general, and sometimes tautological, as to become meaningless and useless. (Freud's "death wish" is a case in point).

Beside the cluster of variables pertaining to human interaction in homicide and the common escalatory process which are both missing in suicide situations, a further indication that suicides differ in etiology from interpersonal violence is the much lesser alcohol involvement in suicide (Goodwin, 1973).

It is my feeling that although there may be common factors in explanations of suicide and homicide, such as stress situations, life histories and certain phenomenological states, there are enough differences in the possible explanatory models so that a conglomerate of homicide-suicide would only confuse the explanations of either type of act.



## II. REVIEW OF FINDINGS

Data on prevalences and associations of any systematic nature have to be derived from studies of police or court records\*. Less extreme and more representative forms of aggressive behavior have not been documented (although attempts should be made to do so).

We must look at data on alcohol use and non-instrumental interpersonal violent crime as indicators (lacking better ones) of the association between alcohol use and aggressive behavior in general. This is the only way to link the information on the association between alcohol use and violent crime with general studies on effects of alcohol. I shall first look at the data available for establishing an association between homicide and (to a lesser extent) assault and the use of alcohol and, secondly, the data available for establishing an association between the two forms of violent crime and prolonged excessive alcohol use (or "alcoholism").

### A. ASSOCIATION BETWEEN ACUTE ALCOHOL USE AND INTERPERSONAL NON-INSTRUMENTAL CRIMES OF VIOLENCE

I will only mention in passing the studies that have been made on the association between "alcohol use", "intoxication", "being under the influence of alcohol", "drinking prior to the crime" etc. and crime in general. These studies may have some practical import, but their theoretical relevance is negligible, especially in the cases where alcohol-related crimes such as drunkenness are included without clear distinctions being drawn. The proportion of acute alcohol use of the "general" criminal offender shows a high and unsystematic variation between samples





from various jurisdictions, providing unknown generalizability. Because the figures are theoretically almost meaningless, I shall refrain from citing any. (For a typical sample of this type of study which is based on availability, the following list will suffice: Wieser, 1964; Kinberg, et al., 1957; Cloninger and Guze, 1970; Ullrich, 1966; Richard, 1966).

There is a considerable amount of statistical information available on rates of crimes of violence in various countries and jurisdictions. However, the existing information on associations of alcohol use and violent crime is not systematically compiled and it is impossible to find any reliable statistical data from culturally delimited well-defined areas. The studies that are available stem from samples of varying compositions. Few are representative of any geographical area, culture or jurisdiction for which relevant statistical or epidemiological data would be available on other relevant variables. Some of the samples have been selected in a way that probably affects the relationship with alcohol use. The difficulties in establishing the presence of alcohol in a representative sample of offenders probably also give rise to biases. (More on these problems in the section: "The nature of the dependent variable", below).



1. Studies examining alcohol use by both offender and victim

The most systematic American treatise of the association between violent crime and presence of alcohol in the offender and victim is Wolfgang's (1958) study of 588 criminal homicides in Philadelphia between 1948 and 1952. He found that alcohol was present in both offender and victim in 43.5 percent of homicides, in the offender only in 10.9 percent and the victim only in 9.2 percent of the cases. Thus the offender had been drinking in 54.4 percent and the victim in 52.7 percent of the homicides, and either one or both in 63.6 percent of the cases.

Mayfield (1972), reports on a study carried out in North Carolina of males who entered the prison system after being convicted of serious assaultive crimes. (Of the 307 subjects studied, the offender had been convicted of homicide in 80% of the cases and of a variety of felony assaults in 20% of the cases). Fifty-eight percent of the offenders were "definitely sober". Among the victims 40% were "definitely sober" in connection with the crime and 35% were "definitely free of alcohol". Pittman and Handy (1964), in their study of 241 cases of aggravated assault in 1961, sampled from the St. Louis Metropolitan Police Department files, show that 57 offenders and 58 victims had consumed alcohol prior to the crime. They suggest that the low proportions (about 20%) may be due to difficulties in detecting or failure to report prior use.





In another study of 395 criminal homicides in the urban area of Chicago in 1965 it was found that "intoxicants were present, according to police records, in 53.5 percent of the homicidal scenes" (Voss and Hepburn, 1968). Page

A number of Finnish studies have established the prevalence of alcohol involvement of both the offender and the victim in various types of violent crime. Verkko, (1951), assumes a direct causal link (via racial and physiological factors) between alcohol use and violent crime in explaining the high incidence of violent crime in Finland. He refers to a study in 1931 by a committee under the chairmanship of Bruno Salmiala. I have summarized the main findings in Table 1, (see Appendix). Page

Absolute numbers are not available and it is thus not possible to get an approximate figure for alcohol involvement in homicides in general, comparable to that of Wolfgang (1958). More detailed information is, however, available for one county in Finland (Vyborg County) between 1920 and 1929 (see Table 2). The Salmiala Committee felt that these were minimum figures on the involvement of alcohol since in many cases no evidence of the presence or absence of alcohol was available in the court records. From Table 2, we can calculate that the total alcohol involvement for murder and intentional manslaughter combined is 69.1%, a figure which is fairly close to Wolfgang's. An interesting difference which may have further explanatory implications



is the fact that in only 34.3 percent of the offences were both victim and offender under the influence of alcohol in the Finnish data as compared to 43.5 percent in Wolfgang's data for Philadelphia, despite the somewhat higher general alcohol involvement in Finland.

Verkko is careful to point out, that the relatively minor role that alcohol plays in murders in Finland is partly definitional; there is a greater probability of a homicide being classified as manslaughter if the offender is under the influence of alcohol.

More recent data from Finland, where violence in connection with alcohol use is seen as a major problem to the extent that the rate of violent crimes (with or without evidence of alcohol involvement) is used as an indicator of "the alcohol situation", show that Salmiala's (see Verkko, 1951) figures are still approximated in Finnish data. For example, Aho (1967), in a study of the court records of 313 homicides (about 50 percent of the cases), and aggravated assaults in Helsinki between 1950 and 1965 found that 85 percent of offenders had been drinking before the crime. He classifies 69 percent as being "drunk" and 16 percent as "slightly intoxicated", the latter having in general a BAC (blood alcohol concentration or level, hereafter referred to as BAC) of less than 0.17 percent.





The percentage for victims was also close to 70. Virkkunen (1974), in a study of 116 homicides in Helsinki in the period 1963-1968 found that 68.1 percent of the victims and 66.4 percent of the offenders had been under the influence of alcohol. According to Krokfors (1970), alcohol was involved in 73 percent of homicides in Finland in 1968. For aggravated assaults the figure was 68 percent and for other assaults 61 percent. He does not specify the prevalence of alcohol use separately for offender and victim.

Janowska (1970), has analysed data on the 279 individuals sentenced for homicide in Poland in 1961. She found that 64.5 percent of these, and 49 percent of the victims, were intoxicated at the time of the crime.

## 2. Studies examining alcohol use by offenders only

Shupe (1954), has reported findings on 882 persons picked up during or immediately after the commission of a felony in Columbus, Ohio, between March 1951 and March 1953. Of the 30 persons arrested for murder 25 (83 percent) had some trace of alcohol in their urine and 67 percent had a level of 0.10 percent and over (see Table 3). His data show a high percentage of involvement of alcohol also in crimes that are not by definition violent in nature. As Shupe points out, the fact that offenders who are under the influence of alcohol have a greater risk of being apprehended by the police than do sober offenders could bias the findings in the direction of too large an alcohol involvement. This should be remembered in interpreting the findings of all studies on alcohol use by crime offenders.



(I will discuss this and similar biasing factors in a section below on "The nature of the dependent variable").

Macdonald (1961), has summarized the findings from ten studies which have provided figures on the proportion of homicide offenders who had been drinking prior to the crime (including the studies by Shupe and Wolfgang). The range is very wide, from 19 to 83 percent, but sizes and nature of the samples vary widely. The mode is between 50 and 60 percent, and in this interval fall all studies with a sample size of 200 and over. Assuming a random sampling procedure, there are comparatively small sampling errors, and thus a figure of 50-60 percent alcohol use by offenders in North America seems sufficiently reliable.

In addition to the studies summarized by Macdonald, geographically scattered data from widely varying types of samples show the pervasiveness of alcohol use by the offender in noninstrumental interpersonal violent crime. A study of 2,234 new arrivals to prison centres in California (1964), in 1959 showed that 60 to 63 percent of offenders in homicides and sex crimes, and other crimes of great personal risk, had been drinking before the crime. These findings were based on personal interviews. Tinklenberg (1973), has reviewed a number of additional studies of both homicides and assaults which show a high proportion of alcohol use prior to these crimes. He also cites his own data which show that eight out of nineteen young violent offenders who had been convicted of murder, manslaughter or assault had been under the influence of alcohol (and five had been under the influence of some other



psychoactive drug). Connor (1973), reports that alcohol involvement of offenders in violent crimes seems to be more pronounced in the Soviet Union than in other countries for which data are available: "In Gorky oblast' (province), 83 percent of all persons convicted of homicide, infliction of serious bodily injury and rape committed their offences in a state of intoxication; in Yaroslavl' oblast' the parallel figures for homicide and rape were 85 percent and 76 percent respectively." According to Connor, Gertsenzon has pointed out large regional variations in the involvement of alcohol by the offender at the time of the crime in the Soviet Union, from a high of 80 percent to a low of 46.8 percent, the lower involvement presumably being due to cultural factors such as a predominantly Moslem population in certain regions with reservations about alcohol use in general. Husson et al. (1973), state that 69 percent of voluntary homicides in metropolitan France were committed under the influence of alcohol. Twenty-nine percent of aggressive assaults were committed under the influence of alcohol.

In another study 36 out of 66 "murderers" (55%) in the Glasgow area in Scotland were "affected by alcohol" at the time of the crime (Gillies, 1965). Gelfand (1971), attributes 50 percent (N=80) of the homicides he studied among the native people in Rhodesia between 1898 and 1930 to the use of alcohol (by tradition: beer). He also studied the preliminary court documents in "murder" cases in 1967-68 and found that 63 percent of the 98 offenders had consumed alcohol prior to the crime. For assaults the percentage of alcohol involvement by offenders





was surprisingly low. Thus in 47 assault cases brought before the courts in one part of Rhodesia in 1963-67 only three were associated with alcohol.\*

Additional studies on the prevalence of alcohol use prior to the commission of homicides and assaults can be found in excellent reviews by Wolfgang (1958) and Wolfgang and Strohm (1956).

The alcohol involvement of special offender samples such as offenders who have been diagnosed as mentally ill has been reported in a number of studies. These samples are probably biased against the role of alcohol as a possible causal factor and they are worthless in comparisons with results pertaining to more randomly selected cases of violent crimes. However, the findings in these samples may be relevant for causal interpretations of possible interaction effects of alcohol use with psychiatric problems in the etiology of violent crime. For this purpose I will mention a sample of these.

Tupin et al. (1973), in a study of 50 males who had committed murder and were detained in a California psychiatric institution found that 13 of them had used alcohol "heavily" at the time of the crime. This did not differ significantly, however, from a group of offenders that had been convicted for non-violent crimes (5 out of 25). In a study by Binns et al. (1969b) of persons charged with a criminal offence who had been referred to psychiatric examination at a hospital in Scotland in 1965-66, 47 percent (N=19) of those charged with assault had been intoxicated at the time of the crime.

McKnight et al. (1964), in a study of 100 mentally ill homicide



offenders in Ontario, Canada, found that "approximately one-fifth of the patients were under the influence of various amounts of alcohol at the time of the offence; however, few, if any, could be considered to have been intoxicated." Pincock (1962), on the other hand, found in a study of individuals referred for psychiatric examination by various courts of metropolitan Winnipeg that 31 of 42 homicidal offenders (73%) and 59 out of 89 offenders (66%) in other aggressive crimes were intoxicated coincidentally with the crime.

### 3. Studies examining alcohol use by victims only

Wilentz and Brady (1961), in a study of violent deaths in a county in New Jersey between 1933 and 1959, found that 31% of the victims of homicide (54 cases out of 175) had been drinking before being killed. Of these they classified 14% (24 cases) as "being under the influence", i.e., having a blood alcohol level of more than 0.15 percent. Spain et al. (1951) studied violent deaths in Westchester County, New York. They found that seven out of the eight homicide victims in the sample had BACs ranging between 0.11 and 0.25 percent. Room (1970) reports on a study done by Hudson in North Carolina showing that in over half of all violent deaths the victim had a BAC of 0.10 or over and stating that the figure would be about 0.20 or 0.25 for homicide victims. In a study of homicide victims in the period between 1947 and 1953 in Hamilton County, Ohio, Cleveland (1955) found that out of the 225 victims (from a total of 337), who had a BAC determination, 86% had concentrations of at least 0.01% and 44% had concentrations of 0.15% and over. In a Canadian study, Tardif (1967) investigated 521 cases of homicides, assaults, rapes and robberies in Montreal in 1964. The presence of alcohol in the victims of homicide was comparatively



low, 17% (N=23). Among the assault, rape and robbery victims a lesser severity of injury meant a lower alcohol involvement. Victims who were hospitalized had used alcohol in 33% of the cases (N=73), those who were only treated but sent home had used alcohol in 26% of the cases (N=152). Victims with light injuries had used alcohol in 16% (N=81) and those with no injuries had used alcohol in 9% of the cases (N=155). Bowden et al. (1958) report on blood and urine alcohol tests carried out on the victims of violent death in Melbourne, Australia, in 1951-56. Forty-one victims of murder were tested, and 19 of these had BACs of 0.15% or over. Also in Australia Birrell (1965), in testing 47 homicide victims found 27 to have at least a trace of alcohol in the blood and 23 to have BAC levels of 0.15% or higher. In a Polish study Puchowski and Tulaczynski (1964) report that 38% of the victims of homicide (sample size unknown) had alcohol in the blood. Le Roux and Smith (1964) in a study of violent death victims in the Cape Town area found that 88 out of the 137 adult homicide victims, i.e., 64%, had positive blood alcohol levels and 50 percent had levels at the time of death of over 150 mg per 100 ml. Medina (1970) reports on a study by Leyton showing that in a sample of homicide victims in Santiago de Chile 62 percent of the male victims of homicides had a blood alcohol level of 0.05% or higher (N=208). The corresponding figure for females was 35% (N=20). Arner (1973) reports that half of homicide victims totalling about 30 among seamen on Norwegian ships between 1957 and 1964 were "more or less" intoxicated at the time of the crime.

#### 4. Other relevant studies

In addition to the conjunctive evidence of alcohol use by the offender and victim in violent crime, I shall mention briefly other descriptive evidence which bears on the concomitance of alcohol use





and aggression.

Both Wolfgang (1958) and Hopwood and Milner (1940) have noted the extremeness of the violence displayed in homicide committed in connection with alcohol use. Wolfgang objectively categorized his data of the homicides he studied to arrive at his conclusion whereas Hopwood and Milner impressionistically note: "A striking feature of alcoholic murders is the malevolence of the crime". Stark (1969), points out the "reckless brutality" of robberies committed after drinking which often lead to severe bodily injuries. Tardif's (1967) findings of increasing alcohol involvement of the victim with increasing seriousness of the injury in assaults, rapes and robberies are also relevant in this context.

Anthropological studies show a disconcerting array of reactions under the influence of alcohol in different societies (Washburne, 1961; and MacAndrew and Edgerton, 1969). Child et al. (1965a), however, in studying literary reports on 139 societies scattered throughout the world, most of them preliterate and homogenous, found that in none of the societies reported on did the expression of hostility lessen during alcohol drinking occasions. Most of the changes were rated as slight increases in the intensity of hostility.

Since different indicators of violence and aggression were used in the above studies some of the alternative hypotheses in accounting for the relationship between alcohol and violence have been eliminated. This is the case, e.g., for the hypothesis that the connection is due to a greater likelihood of offenders under the influence of alcohol being apprehended which creates an inflated association between the two variables. (See the section on "The nature of the dependent variable" for a discussion of these problems).



## 5. Discussion

The data are scattered but show the pervasiveness of the association between violent crime and alcohol use in a number of different cultures, and one can presume that cultural factors or jurisdictional idiosyncracies alone cannot explain the association. However, any systematic comparison between rates from such a variety of samples is impossible and, as pointed out above, there is no way of relating these findings to other epidemiological findings or statistical information to ascertain, for example, the extent to which alcohol involvement in violent crime is related to the per capita consumption, or the consumption of specific beverages over a number of countries or states.\* What is most obviously lacking is a systematic collection of data on the role of alcohol in violent crimes in samples where corresponding epidemiological data of possible causal relevance could be utilized. Especially relevant would be estimates of blood alcohol levels in both the offender and the victim at the time of the crime to get at better data on the relationship between this aspect of alcohol use and violent crime, although the practical difficulties may be insurmountable.

Studies of the alcohol involvement in violent crime should also include better information on the nature of the potential independent variable such as the type of beverage used, etc., to enable more specific epidemiological research and to provide a background for relevant experimental research on aggression.



It is enlightening to turn back to the figures in order to see what type of information would be necessary to show that the association is not due to chance, i.e., that alcohol use and violent crimes are not independent of each other. The most difficult aspect of this task lies in delimiting the universe for the statistical inferences to be drawn, i.e., establishing the population at risk, and, due to the cyclical nature of human activity, in establishing the relevant time periods for the population at risk. The ideal way of approaching the problem would be to get estimates of the proportion of time that the population at risk is intoxicated, the proportion of time that it is committing violent crimes (or aggressive acts, if we are interested in this more general question), and the proportion of time that it is committing violent crimes in an intoxicated state. Needless to say, this is an extremely simplified model, and even if unbiased empirical measurements could be obtained, one would have to take many biasing selective variables into consideration in establishing a null hypothesis.\*

The samples available are of crimes of violence however, and we do not have random time samples of human activities. Let us use Wolfgang's (1958) figures and disregard possible biasing factors such as a greater risk of being apprehended by the police for the intoxicated offender. If the null hypothesis of no connection between a state of intoxication and violent crime were true, we would have to accept as an empirical fact that the population at risk of becoming an offender would





be intoxicated on the average 54.4 percent of their waking hours, since in his sample 54.4 percent of offenders were intoxicated at the time of the crime. Even if a very narrow definition of the population at risk is used, it seems extremely improbable that the null hypothesis would be true.

The value of this type of reasoning lies mainly in directing attention to the conditions which have to be taken into account in specifying the null hypothesis. The probabilities to be used in the null hypothesis have to be conditional probabilities and herein lies the crux of the problem. What are the conditional factors that we would have to take into account? We would probably have to take time of day as one condition which would influence the probability of both the victim and the offender being drunk. Another conditional factor or set of factors affecting the probability of being drunk would be location. The first step towards enabling a satisfactory test of (a much more complicated) null hypothesis would be to gather extensive information on the circumstances of the crime. Even the blood alcohol levels of offenders and victims do not tell us very much by themselves about the degree of association between alcohol and violent crime. This brings us to the most crucial question in the area under study.

Up to this point we have only discussed the possibility that the two events are statistically independent or related to each other. The role of alcohol in the causal explanations of the possible connection has not been touched upon yet. I will just briefly touch on the issue here and postpone a more



detailed discussion until later. Even if all the necessary information were available to test the null hypothesis of no correlation between intoxication (or other aspects of alcohol use) and crimes of violence (or aggressive behavior in general) and the null hypothesis were rejected, it is not established that alcohol has causal relevance in explaining violent crime.

The existence of an association does in no way show that alcohol is a sufficient cause of violent crimes. This is so, since, in fact, few alcohol use situations result in violent crimes. Thus we have to look for other conditional variables which together with alcohol use determine whether a situation leads to violence or not.

Before going into possible explanatory variables and causal models that would explain the correlation, I shall look at the evidence available for the proposition that alcoholism, or prolonged excessive alcohol use, and its effects, is positively associated with crimes of violence.

#### B. ASSOCIATION BETWEEN ALCOHOLISM AND INTERPERSONAL NON-INSTRUMENTAL CRIMES OF VIOLENCE

Again, there is a great variety of studies available in the literature relevant to establishing (at least in theory) whether there is more than a chance association between "alcoholism", "problem drinking", "heavy drinking", etc., and crime in general. Since these are of very limited usefulness for the purposes of this chapter, I shall only refer to what may be a rather randomly available sample of these (Banay, 1941-42; Kinberg, et al., 1957; Smith-Moorhouse and Lynn, 1966; Edwards et al., 1972; MacKay et al., 1967; MacKay, 1963; Maule and Cooper, 1966;



Edwards et al., 1971; Glatt, 1965; Bartholomew and Kelley, 1965). The proportion of alcoholics among offenders in violent crimes other than homicide and assault has also been established in a few studies. For example, Nau (1967) in West Berlin, and Grislain et al., (1968) in France, found high proportions of alcoholics in child abusers, 50% and 65% respectively. Banay (1941-42) found that approximately 28% of sex offenders in Sing Sing prison over a 5-year period were "intemperate" users of alcohol, and in Rada's (1975) California sample of rapists (N=77) 35% were classified as alcoholics.

#### 1. Studies of prison populations

A large majority of studies relevant for an assessment of the association of alcoholism and violent crime, use prison samples (partly because of comparatively easy accessibility, no doubt) and determine alcoholism via interviews; a much smaller number use court records and try to determine alcoholism by independent means available. Still other studies use clinical alcoholic samples and try to determine the prevalence of criminal records for these.\* There would naturally be a smaller chance of finding alcoholics who have committed serious crimes, such as crimes against the person, among out-patients, since they would be more likely to be in prison. On the other hand, as Gibbens and Silberman (1970) point out, prison samples are biased in favor of offenders with long prison sentences. For prevalence estimates of alcoholism in e.g., homicides this fact has to be taken into account in jurisdictions where sober homicide offenders ("murderers") get longer sentences than intoxicated and more likely alcoholic offenders, (in these cases there might be greater tendency to label the crime as manslaughter or to regard drunkenness as an extenuating circumstance). In this case





there would be an underestimation of the prevalence of alcoholism in violent crime.

Most of the studies dealing specifically with homicides and assaults also use more or less arbitrarily selected prison populations in which indices of heavy drinking history or alcoholism are investigated, or they use available clinical populations whose police or court records are investigated. Needless to say, the criteria for problem drinking or alcoholism differ so much from study to study that it is very difficult to draw any general conclusions.\*

Banay (1941-42), in his study of prisoners in Sing Sing prison mentioned above, found that alcoholic criminals (according to his definition "delinquents whose alcoholism led to the commission of crime"), accounted for 31% of all people who were imprisoned for assault in the fiscal year 1938-1939 (35% in 1939-40), and 23% of those imprisoned for homicide (25% in 1939-40). (The other crimes were committed by alcoholics as measured by Banay's criteria as follows: burglary offenders 25% (33% in 1939-40), sex crime offenders 22% (38%), robbers 21% (19%), grand larceny offenders 14% (19%), and offenders in all other crimes 6% (15%), for 1938-39 and 1939-40 respectively.)

There seems to be considerable fluctuation over time in the proportion of inmates with alcohol problems among different types of criminals. Banay presents data for "intemperate" homicide offenders over the period 1935-1940. The proportions of these offenders out of the total homicide offender population



range from 11% to 37% with a mean of approximately 23% (calculated by the present author). Thus in his study the proportion of offenders with alcohol problems was higher for sex offences (28%) than for homicides.

Goodwin et al. (1971), and Guze et al. (1962), report on a sample of male felons about to be released and recent parolees and probationers from Missouri penal institutions (N=223). Using rather broad criteria they arrived at a figure of 43% alcoholics and an additional 11% questionable alcoholics. Some of the criteria used for classification as an alcoholic make links with violent crime definitional to an unknown extent, as pointed out by the authors. The alcoholics were more likely to report rage reactions, feeling irritable more often, and were more likely to have had fights. Sixty-six percent of the alcoholics had one or more arrests for peace disturbance versus 17% of the non-alcoholic felons and 42% had one or more arrests for fights compared to 10% for the non-alcoholics.

Mayfield (1972), in a study referred to earlier, concluded that in his sample of 307 prisoners in North Carolina convicted of serious assaultive crimes (80% for homicides) 36% were problem drinkers. These were more likely to have committed previous serious assaults than the other offenders in his sample. Ullman et al., (1957), in studying one thousand consecutive admissions to a prison in Massachusetts found that those who had been arrested for drunkenness two or more times or had a history of alcoholic psychosis had 0.7 convictions for "pugnacious crimes" per individual as compared to 0.4 convictions for other individuals.



However, in another Massachusetts study of 95 women prisoners, it was found that there was a significantly greater likelihood for more non-violent prisoners to be alcoholics than for violent prisoners (Climent et al., 1973). Violence was measured using objective historical data, ratings by the subject and others and a MMPI profile. How alcoholism was measured is not mentioned. (The possibility of sex specificity in the relationship between alcoholism and violent crime cannot be ruled out).

Gibbens and Silberman (1970), in a study of alcoholism among prisoners, found that "a history of two or more aggressive offences (not necessarily serious ones) was much more common in alcoholics, and they included nearly all of those with a history of both aggressive and sexual offences".

In a study carried out in New South Wales, Australia, McGeorge (1963), found that 22 out of 85 murderers and 59 of 100 offenders in assault and robbery cases were "addicted to drink". In Poland, Janowska (1970), found that 55.6% of the offenders in homicides had been drinking "systematically and excessively". Pittman and Wal (1968) showed that probationers to "Consultation Bureaus for Alcoholism" in Holland had a statistically highly significant tendency to have committed aggressive crimes to a greater extent than a random control sample in other probationary agencies.

A number of studies have been carried out on special offender populations which have been regarded as having proclivities towards violent behaviour and they may thus be relevant for the study of interaction effects between





alcoholism and organic or psychological conditions in the etiology of violent behavior. Lanzkron (1962-63), in a study of 150 mental patients charged or indicted with murder, found that 34 percent had shown "intemperate" use of alcohol. (In only 12.7 percent of the cases could it be ascertained from the records that the accused had been "drunk" at the time of the crime). Binns et al. (1969a), found in a study of persons charged with a criminal offence and remanded for psychiatric examination that 14 out of 107 referrals had been clinically diagnosed as alcoholics. In another similar study 19 out of 83 werethus diagnosed, (Binns et al., 1969b).

The drawback with all prison samples is, as pointed out above, that they are weighted in favor of types of crime and criminals which have longer sentences. More severe crimes and, more importantly, more habitual criminals, whatever this means in terms of alcohol involvement, are over-represented in these populations. It would be important to include length of sentence as a control variable in prison studies in general.

## 2. Studies of other populations

Evidence of an association between alcoholism and violent behavior tendencies (i.e. not violent crime) comes from a study of Tuason (1971), who found that 12 out of 30 violent patients hospitalized in a mental health centre were "alcoholics" and six were "probable alcoholics". In reporting on the investigation of court records by the Salmiala Committee in Finland, Verkkö notes that the offender in "many cases" was a confirmed alcoholic, although perhaps not under the acute influence of alcohol at



the time of the crime. He does not, however, present any quantified data. Some evidence against a relationship between the two variables is to be found in Antons' (1970), study of 67 "Kurhaus" patients in which a number of different measures of aggressiveness were used, including a rating by the therapists at the Kurhaus. He found that on the objective measures of aggressiveness the alcoholics were no more aggressive than the comparison group of 67 other "Kurhaus" patients. (On a self-rating scale, however, the alcoholics rated themselves as more aggressive than the comparison group). Despite such scattered evidence against an association between alcoholism and violent behavior, the evidence is rather heavily in favor of a relationship between alcoholism and at least violent crime, although inferences here, as was the case for acute alcohol use, are hampered by the lack of control data.

Information on the prevalence of alcoholism among victims of homicide can be gleaned from several mortality studies. For instance, Sundby (1967), found that it was two to three times more probable for an alcoholic to die by homicide as compared to the general population. In most mortality studies of alcoholics homicides are lumped in the same category with accidents and suicides as "violent deaths" (due to the small numbers of cases).

### 3. Discussion

The central question in assessing the association between alcoholism and violent crime (and possible causal explanations



between the two) is the extent to which this typological entity explains violent behavior if the greater probability of being intoxicated at any time is controlled for, assuming that acute alcohol use is a relevant explanatory factor. At the present time, there are no reliable and generalizable data available which would permit an assessment of the relative effects of acute intoxication and the cluster of characteristics that is labelled "alcoholism" (or the factors that are causally linked to it) on the association between alcoholism and violent crime. Some indications of the extent to which intoxication plays a role in general crimes of alcoholics can be had from Banay's (1941-42) study of 200 "primary intemperate" white males. He found that 58 percent of these males had been intoxicated at the time of the crime. I have only been able to locate one study which would show the prevalence of alcohol use in connection with violent crimes in a sample of alcoholic offenders. Mayfield (1972) found that the problem drinkers in his sample were sober at the time of the violent crime in only 20% of the cases. The corresponding figure for other offenders was 40%.





### III. EXPLANATORY MODELS

The problems of determining the population at risk discussed above, are partly identical with the problems of explaining the association between alcohol use and alcoholism and crimes of violence. In either case one is forced to peel off layer after layer of possible biasing factors which would give rise to a spurious causal relationship between the two phenomena. The only way to test a true "direct" relationship between the two variables is through experiments but then again one is up against the problem of generalizing the findings, and this dilemma is reflected in the discussion of explanatory models below.

In the reasoning on possible causal models explaining the association between acute alcohol use and alcoholism and violent crime, I have taken for granted that the null hypothesis does not hold true.\* This is based partly on the "statistical" reasoning above but the reasons for rejecting the null hypothesis are probably based as much on "common sense" and personal knowledge of human behavior under the influence of alcohol.

In looking for explanations of the correlation between alcohol use - be it acute alcohol use or long term excessive use - and crimes of violence I will refrain from dividing the discussion below into fields of inquiry from which the explanatory variables have been taken. It is often difficult to assign an explanatory variable to a field. This is so because the intervening variables in an explanatory model are seldom specified, and presumably often belong to several different fields. As often is the case in explaining behavior, conditional factors in many fields of inquiry are also relevant in the explanation, and these are tacitly assumed to have some "normal" value in the phenomena explained. Thus, the fact that the assignment of explanatory or intervening variables and



models to various fields (to the extent that it is attempted in the discussion below), is rather arbitrary, reflects the state of explanations in this area of research. In ascribing the explanations to variables in different fields, one runs into difficulties which traditionally have been considered to be philosophical such as the truth or falsehood of the positivistic doctrine of "psycho-physical parallellism" or "psycho-physical identity" (e.g., Polten, 1973).

Contrary to the view of some social scientists (e.g., Shoham et al., 1974), I feel that there is reason to include factors from other disciplines in the explanation of behavior, and this especially in dealing with alcohol use which has undeniable pharmacological and psychological effects, although these may not be constant over individuals and time. I will include such variables since it is possible, and in some cases very probable, that they covary with "social" variables relevant in this context (such as social characteristics of the drinking situation).

The truly interdisciplinary nature of the problem can be seen from looking at some of the literature relevant to the problem:

1. The studies reviewed above on the proportion of offenders and victims who were under the effect of alcohol during the commission of a violent crime.
2. The few rather unspecific studies, also reviewed above, giving the proportion of "alcoholics" ("heavy drinkers", "problem drinkers",



"excessive drinkers") among persons detained for violent crimes.

3. Psychological experiments on the effect of different doses and types of alcohol on the behavior of alcoholics or non-alcoholics.

4. Anthropological descriptions of predominantly primitive tribes and their behavior in alcohol use situations.

5. Studies of EEG-patterns, brain syndromes, head injuries in alcoholics and non-alcoholics or violent offenders in non-alcohol conditions and after consumption of alcohol.

6. Longitudinal studies of genetic and developmental factors, in the etiology of alcohol problems and other behavior tendencies, including proclivities towards violent behavior.

Studies of type 1) and 2) generally provide no basis for inferences as to the causal relationship between the effects of alcohol and aggressive behavior. Studies of type 3) on the other hand are often designed to get at the "pure" effect of alcohol, making generalizations to real life situations rather questionable by leaving out relevant conditional factors, (even if we overlook the difficulties in operationalizing the concept of aggression). Type 4) studies can probably best give clues as to the normative determinants affecting the connection of alcohol use and aggressive behavior. Studies of type 5) are generally designed to study factors predisposing individuals





towards violence in connection with alcohol use, and studies of type 6) give some indication whether genetic or developmental factors account for both violent behavior tendencies and a greater probability of alcohol use (and/or alcoholism).

In addition to these types of studies, there are others which are more indirectly related to the subject matter of the connection between alcohol and violence. The effects of alcohol on performance of tasks that require conceptual activity, judgment, motor skills, etc., have been studied rather extensively and these effects are relevant to the performance of any act including violent acts. Still other studies can give rise to hypotheses regarding the proportion of violent crimes explainable by some facet of alcohol use or can be relevant for setting up causal models in the explanation of an association between alcohol use and violence. These include the following: biological studies on the etiology of violent behavior (e.g., testosterone production, XYY chromosomal abnormalities), studies of special populations prone to violence such as temporal lobe epileptics, and general psychological studies on aggression (without alcohol use as one variable).



A. EXPLANATION OF THE POSITIVE RELATIONSHIP BETWEEN ALCOHOL  
USE AND CRIMES OF VIOLENCE

1. Nature of the independent variable

In epidemiological studies "alcohol use prior to the crime" and other standard labels by their very nature include (in a seldom explicated form) the modal patterns and circumstances in which alcohol is used within a culture, e.g., the type of drink consumed, the selection of participants to the drinking situations and the norms governing the behavior of these people in alcohol use situations. When the data are extracted from police or court records, the crucial operationalization of the concept is dependent on not only the criteria of the researcher, but also those of the arresting police officer and other individuals making decisions in the intermediate stages between the arrest and a possible court conviction. The testimony of the accused, the victim and witnesses also enter in here as well as the interpretations of the individuals doing the coding for research purposes. The same holds true for "intoxication", which probably is even less reliable in the recordings of officials and in the testimonies given. Blood alcohol level is a more exact measure, but the concepts do not overlap completely considering the physiological and psychological factors leading to variations of subjective states and performance measures both within and between persons with the same blood alcohol concentrations (e.g., due to adaptation phenomena, see Kalant, 1961).



Besides, this measure has been used very sparingly in relevant epidemiological studies of offenders in violent crime.

a. Experiments with non-alcoholics

In explanations of the relationship between alcohol use and violent crime via the acute effects of alcohol, the independent variable of "alcohol use" is too vague to stand up to closer analysis. A number of different independent alcohol variables can be responsible for the correlation between violent crime and alcohol use. This has been taken into account in experimental designs (and in some interpretations of epidemiological data). In the experimental studies the most frequently used independent variable is the BAC of the subject or some other closely correlated measure such as quantity consumed per unit of body weight. Of equal a priori relevance in the explanation of the relationship are some other independent variables. Some of these have been incorporated into research designs dealing with alcohol and aggressive behavior or related dependent variables. First, however, a look at a few studies using BAC as the independent variable, and the range of values used.

Hartocollis (1962) used intravenous administration of ethyl alcohol, thereby controlling for the independent effects of "suggestion" (perhaps better conceptualized as psychological or cultural "meaning" of alcohol), which could give rise to a spurious relationship between BAC and aggressive behavior. The approximate BAC level during the first hour of the experiment was 0.10 percent (one cc absolute ethyl alcohol per kg of body weight). Bennett et. al. (1969) used three





different alcohol dose levels of 0.33, 0.67, and 1.00 ml (cc) of absolute alcohol per kg of body weight in the form of vodka mixed with orange juice in addition to a placebo condition. The mean BAC's attained were 0.030, 0.058 and 0.086% respectively (measured by Breathalyzer test). Shuntich and Taylor (1972) in their experiment which also measured alcohol effects on aggressive electrical shock settings, used a dose of 0.9 ml of 100 proof bourbon per kg of body weight as their alcohol condition, which was compared to a placebo and a control condition. They did not measure the actual BAC attained in their subjects. Hetherington and Wray (1964) gave their subjects in the alcohol condition 0.35 cc of ethyl alcohol per kg of the subject's body weight. In the non-alcohol condition they were given a placebo drink disguised as alcohol. The disguise was successful in that an approximately equal proportion of subjects in both conditions (84 and 87 out of 96) thought they had been given alcohol. Kastl (1969) in his experiment on ego functioning under alcohol used three different alcohol doses, 0.33, 0.67 and 1.00 cc of absolute alcohol per kg body weight, in addition to the control condition where no alcohol was given. The alcoholic beverage was vodka mixed with lime juice. Katkin et al. (1970) in their experiment on the effects of the congener content of vodka and bourbon on psychomotor performance gave their subjects an amount of 0.4 cc of absolute alcohol per kg body weight. This dose was



given four times at one hour intervals. The placebo condition was tap water, and in the experimental condition alcoholic beverages were mixed with tap water. The mean BAC's ranged from 0.03% to 0.08% over the different sessions. In another experiment, this one on congener effect on risk taking, Katkin et al (1970) gave their subjects a total of 0.8 cc of absolute alcohol per kg of body weight in the form of vodka and bourbon (both with four times their normal congener content), and congener free synthetic alcohol as a control. In one condition of this experiment, the mean BAC was 0.08%, and in the other a falling BAC of 0.08%. Tarter et al. (1971) in their experiment on the effects of alcohol on "perceptual, perceptual-motor and cognitive capacities" used 95% commercial ethyl alcohol mixed with orange drink to attain a mean blood alcohol level of 0.08%. They refer to two other similar studies in which the BAC's were 0.03 and 0.06%. The subjects in Bruun's (1959) experiments had extremely high blood alcohol levels ranging from a mean of 0.08% after two hours to 0.21% at the end of the six-hour experiment. The BAC's were, however, based on theoretical calculations and the fact that the subjects ate a meal at two hours into the experiment means that the BAC's probably did not reach this level, as Bruun points out. The subjects were allowed to choose between five different beverages, and drink as much as they wanted.

The assessment of dose levels used in animal studies are beyond the competency of this author, and consequently only



short mention will be made of the type of independent variable that has been used in these studies. Weitz (1974) used three different amounts of ethanol solution in her experiment on the fighting behavior of male hooded rats, in addition to a non alcohol condition. Raynes and Ryback (1970) used congener content as one independent variable in their experiment with Siamese fighting fish (Betta splendens), the other independent variable being an alcohol as compared to a non-alcohol condition. MacDonnell and Ehmer (1969) used three different dose levels 0.37, 0.75, and 1.5 grams of ethanol in cats whose brains were stimulated to produce attack behavior.

b. Experiments with alcoholics

The problems inherent in the operationalization of the concepts of "alcoholism", "problem drinking", etc., are reflected in the wide range of definitions used in all types of studies dealing with this subpopulation. (For a revealing discussion of different ways of operationalizing the alcoholism concept, see Edwards et al., 1971.) The extent to which the definitions and samples differ systematically between epidemiological investigations (primarily of prison samples) and clinical and experimental samples is almost impossible to ascertain. (The findings by Mayfield (1972) mentioned earlier, that a large proportion of prisoners classified as problem drinkers had not in effect sought treatment for alcoholism, points towards the possibility that experimental and clinical studies of aggression in alcoholics deal with a different population from the one tapped by epidemiological prison studies.)





Experiments with alcoholics have typically been of longer duration in order to get a representative sample of alcoholic drinking, which generally has been the intended independent variable. Docter and Bernal (1964) studied the physiological and social reactions of two male alcoholics during a drinking period of 14 days. Mendelson et al. (1964) studied social interaction and other behavior of alcoholic subjects during an experimental drinking period of 24 days. Alcohol in the form of whisky was given at six occasions during the day, with four hour intervals. The amounts were gradually increased from 6 oz. to 40 oz. of whisky per day. McNamee et al. (1968) in their study of affect, thought content and general behaviour in alcoholics used a seven day drinking period in which the subjects paced their own drinking of bourbon. The BAC's are probably higher and the main effects of conjunctive or intervening variables correlated with prolonged drinking are probably causally relevant in this type of study.

Mayfield and Allen (1967) in an experimental study on the effect of alcohol on the affective state of groups of alcoholic patients, severely depressed patients and controls, used intravenously administered alcohol. The mean BAC's over the three groups was approximately 0.06% as measured by Breathalyzer test; the range was 0.04 to 0.08%. Vannicelli (1972) in her experiment on mood and self-perception of alcoholics attained mean BAC levels of 0.019, 0.045, 0.095 and 0.158 by giving the subjects vodka mixed with



orange juice. The subjects in van der Spuy's experiment (1972) on the effects of alcohol on the mood of alcoholics received brandy in a diluted or undiluted form according to choice. Almost all the subjects drank 8 oz. of brandy during a 30 minute period before testing began.\* In the hypothetical 70 kg man this would mean administration of 1.3 cc per kg body weight. These experiments are relevant in determining the role of alcoholism as a conditional variable in the accounting for the link between acute alcohol use and aggressive behavior. To get at the main effects of alcoholism we will have to consider whether alcoholics have a higher probability of aggression even outside alcohol use situations.

### c. Discussion

The most frequently extractable independent variable in experimental studies is blood alcohol concentration. It has ranged in specificity from intravenous injections of ethyl alcohol with placebo included in the design to oral ingestion of specified amounts of absolute alcohol, generally adjusted to the weight of the subject, and, at the other end of the scale, an unspecified amount of an unspecified type of alcoholic beverage available to the subjects of a free choice basis. Another independent variable is the type of beverage; most often beer and some distilled spirit compared in their effects. Related to the latter are studies using congener content as independent variable (often with high congener concentrations not representative of any widely used beverages). Some studies



carried out in more natural settings use, in addition to specific alcohol variables, the whole social drinking situation as the independent variable (at least implicitly).

In human experiments using non-alcoholics as subjects and having aggression or related measures as dependent variables, the highest BAC's used have been around 0.10. This is not representative of the BAC's found in Shupe's study (1954) where 43 to 88 percent of persons arrested for various types of assault, during or immediately after commission of the act had BAC's of 0.10% or higher. Recalculation of Shupe's figures shows that 69% of offenders in assaultive crimes had BAC's of 0.10% or higher. For homicides the percentage was 67%, for robbery 60% and for rape 45%. Among offenders who had at least a trace of alcohol in their blood the percentage of those having over 0.10% was 80% for homicides, 91% for purely assaultive crimes, 84% for robberies and 86% for rapes.\* The blood alcohol levels used in experimental studies are thus definitely at the lower end of those found in the offender in violent crimes, although we have to take into account the higher risk of being apprehended at high BAC's. The extent to which the BAC's of experimental studies are representative of the levels in less severe aggressive acts is not known. Kastl (1969) has noted the possibility that doses of one cc of absolute alcohol per kg of body weight may be too low for discernable effects





on "regression".

Many conjunctive variables which could have had an independent main effect on the dependent variable have been eliminated with the experimental setups, but so have perhaps important conditional variables which are necessary for alcohol to increase the probability of aggression (see the section on "Conditional or interactional models", below and pages 57 - 60 for an explanation of the different types of variables discussed here). The most rigorous explication attempt of the independent variables vaguely used in epidemiological studies or stored in common knowledge is the intravenous administration of ethyl alcohol (e.g., Hartocollis, 1962). The symbolic cues (or "suggestion") associated with alcohol use are thus eliminated, and so are possible congener effects. The next step in the line of "rigor" of the independent variable is orally given congener free alcohol, with control groups which are led to believe that they also receive alcohol (e.g., Hetherington and Wray, 1964). Next in line are experiments where congener levels are not controlled for, such as those where bourbon is given to the subjects (e.g., Shuntich and Taylor, 1972). Finally, small group experiments tend to use comparatively representative social settings as part of the methodology, and thus introduce what can best be described as a conglomerate of independent variables into the experiments (Takala et al., 1957; Bruun, 1962; Kalin et al., 1972; Kalin, 1972; McClelland and Davis, 1972; Boyatzis, 1974; Wilsnack, 1974). Also, in these studies drinking amounts and types of beverage are typically available to the subjects on a free choice basis which adds



to the generalizability of the findings, but makes the explication of causally relevant independent, conjunctive and conditional variables very difficult. Many of these small group experiments with non-alcoholics and several of the representative ones with alcoholics are extended in time and this again may be a factor in explaining aggressive reactions. It has been noted that electrical shock settings tend to get higher with the passage of time in typical experiments with the "aggression machine". This is true also for non-alcohol conditions (Bennett et al., 1969; Buss, 1963). The subjects in extended small group studies may thus become more prone to interpersonal aggression due to this factor, independently of any alcohol effects. As mentioned above, in many of the much lengthier experiments with alcoholics the effects of alcohol use may be confounded with other variables correlated with the extended nature of experiment, such as the greater probability of sleep deprivation.

The studies mentioned in this section have primarily dealt with BAC or amount drunk as independent variables. Other studies have measured the effects of type of beverage (typically beer vs some distilled beverage, Boyatzis, 1974; Takala et al., 1957) or congeners on aggression or related behavior (Katkinet al., 1970). Beside BAC, type of beverage and congeners, there are other factors related to physiological changes after ingestion of alcohol which also have been suggested as causative in behavior changes.



Kalant (1961), among others, has suggested rate of change in blood alcohol level as a potential causative factor. Tinklenberg (1973) suggests that one might expect different influences on aggressiveness depending on whether BAC's are rising, stationary or falling. (For experimental evidence of the causal significance of this factor on motor skills and cognitive skills, see Hurst and Bagley, 1972.)

Cultural factors are most relevant in determining many of the factors discussed in this section. Choice of beverage and drinking speed affect BAC levels, in addition to having other physiological effects. Other modal factors of a conditional or conjunctive nature are also determined by cultural definitions and expectations. This is true for length of drinking occasion, nutritional habits in drinking situations, the composition of the drinking group, etc. Again we find that epidemiological and statistical information of correlations between violent crime and "alcohol use" from different cultures do not specify the independent variable in this respect although this type of data would not be hard to collect. Differences in the alcohol involvement in violent crime (and aggression generally) between different cultures could be related to these and other culturally determined factors.

Needless to say, the specification of the relevant independent variable or variables contained under the epidemiological labels has vast implications for prevention of violence connected with alcohol use.





As we will see below, no systematic studies have been carried out to assess the differential causal relevance of the different independent alcohol variables discussed above and conjunctive (mainly social) variables of typical alcohol use situations.

## 2. Nature of the dependent variable

Although this chapter in its epidemiological review section has been limited on the whole to studies of assaults and homicides there remain several more or less idiosyncratic factors which may have an effect on the nature of the variable that alcohol use is correlated with in these studies. The relationship may, in fact, not be with a representative sample of violent crimes, but with some more selective variable. This is true whether the data are gleaned from police or court records or by ascertaining the BAC's of offenders apprehended by the police. Blum (1967), points out that "the relationship now shown between alcohol use and crime is in fact a relationship between being caught and being a drinker rather than in being a drinker and being a criminal." This aspect has been discussed at various points above, and by other authors (Shupe, 1954; Amir, 1967).

The proportion of unsolved crimes is a good indicator of the importance of biasing factors in apprehending the offender. In the most cited American study, Wolfgang's (1958) study on homicides, there were only six percent unsolved crimes in the records. This factor would thus not have much effect on Wolfgang's findings, which have been



replicated in many studies, Wolfgang (1958) also surveyed 6,435 criminal homicides in 18 cities between 1948 and 1952 and found that 90% had been cleared by arrest. There is undoubtedly great variation between countries and jurisdictions and great variations within some of these over time. Macdonald (1961) in reviewing seven studies found a range of between 3 and 37 percent of unsolved homicides. Other factors may cause an "internal shift" from the crime of assault (with a lesser chance of coming to the attention of the authorities) to a homicide in alcohol use situations and thus cause an artificially high relationship between alcohol use and homicide. (On the other hand the association with assault would weaken). One such factor has been pointed out by Wolfgang (1958) and later by Pittman and Handy (1964) who remark on the surprising lack of studies on aggravated assault: "...often the line dividing aggravated assault from homicide is so thin that a factor such as the speed of an ambulance carrying the victim to the hospital will determine whether the crime will be aggravated assault or homicide." It is probable and has been pointed out by Wolfgang (1958) that other circumstances being equal there is a smaller likelihood for an intoxicated offender, victim or witness to an assault to phone an ambulance in time to save the victim's life.

The availability of weapons is one factor among many which will affect the escalation of aggression into interpersonal violence (Mayfield, 1972) and thus the nature of the dependent variable in current epidemiological studies.



In certain subcultures it is common to bring along weapons (e.g., "Saturday night specials") for drinking occasions, especially the ones characterized as "time out" on week-ends and other potentially long drinking bouts. The higher the probability of intoxication among all relevant individuals in a drinking and aggression situation, the higher the likelihood of escalation into violence, it would seem, since attempts at intervention by others after the eruption of violence will be less likely.

Even a dependent variable such as maliciousness or violent character of the crime (Wolfgang, 1958) i.e., the use of unnecessary force and excessive number of violent acts (as shown by e.g., stab wounds) in the commission of the crime, is not completely free of biasing factors of the kind discussed above. Also here the intoxication of possible bystanders will have an influence. However, it is probably a less biased indicator of aggressive tendencies than the mere fact of homicide and was shown by Wolfgang (1958) to have a positive relationship with alcohol use by the offender.

There is another type of biasing factor of a more rational kind, which also has been noted by several authors. Alcohol use may not only be a causal factor in aggression, sexual behavior, etc., it can also, as almost anything related to human behavior can, be part of a means - ends scheme. Carpenter and Armenti (1972) mention the "planned consequences of alcohol use". Other authors, e.g., Blumer (1973) state





that, "drinking for courage" is not infrequent in assaultive crimes. This reasoning, however, assumes a direct causal effect of alcohol on aggressive behavior tendencies.

Although "drinking for courage" may be a factor which inflates the association of alcohol with violent crime it also assumes that alcohol effects are relevant in the causal accounting of the relationship.

Finally, there is one rational biasing factor that does not presume a causal connection, but relies more on the epidemiological association and popular assumptions of diminished mental abilities as a consequence of alcohol use. These assumptions (which are undeniably correct) are reflected in the legislation and connected with ideas about moral responsibility. The defendant (and presumed offender) in crime would, in many jurisdictions, gain special consideration if alcohol were implicated as a causal factor. Consequently, some defendants could be expected to exaggerate the role of alcohol in the commission of a crime. This is a factor mentioned by e.g., Gelfand (1971) and Amir (1967), and has been noted particularly in connection with child abuse (McCaghy, 1968; Swanson, 1968). The offender would also, and this is important in crimes such as child abuse which are considered particularly morally repugnant, regain some of the self-esteem he may have lost by at least overplaying the causal role of alcohol in the crime. To the extent that testimony by the offender is used to determine alcohol involvement in epidemiological crime studies, this factor would lead to



an exaggerated association with alcohol use.

None of the factors cited above are present in the experimental and quasi-experimental studies, which are our main resource in establishing causal relationships between alcohol use and violence.

The dependent variables used in experimental studies fall short of assaultive behavior and homicide, for obvious ethical reasons. The most common dependent variable of direct relevance to violent behavior is aggression as measured by electrical shock settings towards another person, who is (allegedly) frustrating the subject. Others, which have been included in the discussion below include aggressive "mood" as determined by an adjective check list (Mayfield and Allen, 1967), feelings of aggressive "power" as determined by TAT projective stories (Kalin, et al 1972; Kalin, 1972; McClelland and Davis, 1972), appreciation of humorous cartoons with an aggressive content (Hetherington and Wray, 1964). In some of the studies reviewed below the dependent variable has been even further removed from the everyday use of the concept "aggression" but they are reviewed since they have distinct semantical, and perhaps some empirical links with aggression and secondly because they are seen by the investigators as linked to aggression. They could also be seen as potential intervening (and/or perhaps conditional) variables in explanatory models, and thus methodologically used as indicators of "aggression".



One assumption which must be made to justify the relevance of the findings from these mainly experimental studies for the accounting of the association between alcohol and violent crime, is that there is a continuum from aggressive behavior as displayed e.g., by electrical shocks given to another person, to the extreme forms of interpersonal violence. It is difficult to accept the existence of such a continuum unconditionnally considering the extraneous factors entering into the determination of the type of crime and whether it will escalate into a crime or just stay at the level of e.g., verbal aggression. There may be a physiological continuum of readiness from milder forms of aggressive behavior to interpersonal violence, perhaps with some qualitative physiological threshold changes.\* However, we have to remember that we are dealing with social behavior. This means that social definitions of behavior and normative strictures will come in at various points in the continuum and thus make it into a nominal scale with qualitative jumps. There are also institutional means in societies to enforce this qualitative stricture, and individuals in society are socialized into these definitions and in most cases have internalized them. Thus, also on this basis, one should not fall into the trap of inferring that outside of higher values on the independent explanatory variables, e.g., blood alcohol levels, no additional factors are needed to





explain violence (see section on the "direct cause paradigm", below).

This chapter has been limited to interpersonal non-instrumental crimes of violence since it was felt that other types of violent crime are etiologically different. For the same reason the studies reviewed for their explanatory significance should be limited by the same criteria. A large proportion of these studies deal with interpersonal aggression in a rather limited sense, as when there is no face-to-face contact between the two subjects and the "communication" consists of electric shocks allegedly determined in strength by the adversary. The majority of the experiments is also clearly instrumental in nature. This is true almost by definition in studies designed under the frustration-aggression paradigm. "Frustration" is operationally defined as "blocked goal-directed activity" in these studies (Buss, 1963), and the concept of goal-directedness implies that the behavior arising from frustration, i.e., the aggressive behavior, can be seen as an instrumental act designed to remove the "blocking agent", as it were.

The problems encountered in transferring the criterion of non-instrumentality from violent crime to experimental aggression are partly definitional. This is so, because extreme severity of aggression is a definitional attribute of noninstrumentality. This is to say that milder forms of aggression in response to the same situation (which had led to "noninstrumental" violent crime) could more easily have been perceived as instrumental in achieving the imputed goal



of the offender. In order to get at noninstrumental aggression, experiments would have to be designed differently, and this has been tried by direct provocation, arbitrary reactions, taunting, etc. Another way out is to attack the problem on epidemiological front and find out more about the association between alcohol use and more representative forms of aggression and the conjunctive prevalence of the two in the population at risk. We would thus not be limited to crimes of violence as the only epidemiological indicator of aggression and we would have epidemiological knowledge of a type of aggression which could more easily be replicated in experimental settings. (A survey approach to ascertain the association and prevalence, with all its limitations (see Pernanen, 1974), seems possible). An indication of the relevance of epidemiological studies of less severe forms of aggression to the study of violent crime is the frequency of the escalation process in the etiology of violent crime (see section on escalation below). This also provides a basis for an extrapolation of the experimental findings (on "aggression") to real life situations in which violent behavior is displayed and violent crimes committed.

### 3. General remarks on the explanations

In reading the presentation of models which have been used to explain the connection between alcohol and violence and the many more tentative interpretations based on the scattered data that are available at this time, it should be borne in mind that the possible explanatory models are not



exclusive of each other. In fact, the variables and causal connections between them may all appear in explanations of some cases of violent behavior in connection with alcohol use. It is probably true that all the variables put forth in the explanations below singly or in conjunction with others are relevant in the explanation of separate subsets of all violent behavior in our world. Some of the variables presented in the literature are rather general and thus the models derived from these do not have much explanatory value. The explanations have in general been limited to three and, in some instances, four variate cases, e.g., the independent variable, one or two conditional and/or intervening variables and the dependent variable. The reason for this limitation is that the empirical studies relevant to the explanation of aggressive behavior and the interpretations of their findings have limited themselves to this number of variables, and that the models would be hard to conceptualize with more variables included in them. Considering the knowledge at hand it seems unnecessary to complicate matters.

One thing should be borne in mind: there is a very important distinction between explaining individual acts of violent behavior and explaining aggregate statistics of violence. If one, for example, looks at the variations over time or geographical area or analyzes a sample of violent acts or violent offenders by using multivariate techniques, thus getting the proportion of the variation explained by each independent explanatory variable, one arrives at a model that cannot strictly be called a causal one since





the data are, in fact, made up of cases where different causal models of violent behavior apply and the dependent variable is the aggregate rate of violent behavior (in fact, the explanatory model arrived at this way may not explain any single case of violence by itself); b) the analysis will not detect the explanatory import of variables that have common values in all aggressive acts, because the analysis is non-experimental and these variables are not systematically manipulated, although these common variables would enter into an explanation of each individual act of violent behavior. (Here physiological variables with threshold values come to mind ) These two types of dependent variable (aggregate rates and individual acts of violence) should be kept apart in trying to find explanations of violence.\* On the individual level one should be especially sceptical of attempts at unitary explanations of all types of violence or even interpersonal non-instrumental violent crime.

"Alcohol use" and "violence" (or "aggression") will be used very inclusively and in the traditional unspecific manner in the discussion. The label "alcohol use" will potentially include all the different independent variables which have been used in experimental studies and which have been dealt with above in connection with the discussion on the nature of the independent variable. As regards the dependent variable, the focus will be on non-instrumental and interpersonal violence. The discussion will range indiscriminately over the whole presumed aggression - violence continuum.



I have decided to analyse the available data, hypotheses, interpretations of data and theories from a more formal point of view than is usual. I have done so because of the difficulty in assigning the truly independent, or even conditional and intervening variables into any field of study, and the fact that the explanation in all probability would have to include intervening and/or conditional variables from several academic disciplines. Moreover, and at this stage of knowledge perhaps more importantly, the formal methodological designs of empirical studies in this as in other problem areas largely determine the substantive findings which will be arrived at and this fact can best be brought forth by this formal approach. For example, in a study which investigates the situational determinants of violence in connection with alcohol use, the contribution of predispositional or other long term variables will be ignored and the selection of subjects for study will be determined by this. With the easy availability of college or university students as subjects or respondents and the generally small sample sizes, conditional variables of a predispositional type will be left out of consideration whether they are seen basically as biological, psychological or sociological in nature.

In the discussion above I have talked about a number of different types of variables and relationships, e. g., "conditional" and "conjunctive" variables which are definable by their role in explanatory models. I shall



attempt a rather strict definition of these formal relationships and variables which are used for analytical purposes in this chapter. The following will be dealt with: direct cause, conjunctive, conditional, interactive and common cause relationships and intervening variables.

The direct cause relationship is the relationship between the independent variable and the dependent variable under the assumption that variations in the independent variable lead to variations in the dependent variable independently of variations on any other variables. This is a very strong assumption, but it has implicitly guided much of experimental research in the field of alcohol and aggression as will be seen in the discussion of the following section.

The conjunctive relationship, which is a special case of a spurious relationship is most easily explicable by symbolic representation. Let us represent alcohol by "A", violence by "V", and a third (conjunctive) variable by "Y". The epidemiological association between alcohol and violence can be represented by the following statement:

$P(A \cap V) > P(A) \times P(V)$ , i. e., the joint occurrence of alcohol use and violence is higher than would be the case if the two phenomena were statistically independent of each other. (The expression  $P(A) \times P(V)$  represents the null hypothesis.) This association could be due to the fact that a third variable Y increases the probability of violent behavior and that it is statistically associated with alcohol use:

$P(A \cap Y) > P(A) \times P(Y)$ . Thus conjunctive variables are the



variables that are idiosyncratically clustered, often due to cultural factors, with the independent variable (alcohol use). They can give rise to a correlation between the latter and a dependent variable, e. g., violent behavior. From our point of view, the strategy would be to look for factors which are associated with alcohol use (or alcoholism) in a culture and may have independent main effects on violent behavior. The difference between this relationship and a common cause relationship is that the third factor in this case does not increase the probability of alcohol use (in addition to its effect on violent behavior).

In the conditional relationship we again assume that a third variable is associated with alcohol use to a greater extent than expected by chance:  $P(A \cap Y) > P(A) \times P(Y)$ . In the conditional relationship, however, alcohol is a causal agent in the increased probability of violence in alcohol use situations, but only in situations in which variable Y has specified values. Alcohol in this relationship has no main effect on the probability of violence, and neither does Y. In conjunction with Y, however, alcohol use increases the probability of violence.

In the related interactive relationship both alcohol use and variable Y have independent main effects on the probability of violence. These effects are, however, compounded in a non-additive way making the effect on the probability stronger than would be expected by the two main effects. A possible example is "pathological intoxication"





in individuals with temporal lobe dysfunctions. There are probably main effects of both alcohol use and the physiological dysfunction, but these effects are exacerbated when these factors are combined.

The common cause relationship is too familiar a concept to need a long explanation here. Basically what is intended by the concept in this context is that a third variable Y increases the probability of the simultaneous occurrence of both alcohol use (alcoholism), and violent behavior, thus giving rise to a spurious causal relationship between alcohol and violence.

The end result of all these relationships: the direct cause, conjunctive, conditional, interactive and common cause relationships is a higher-than-chance association between alcohol use (alcoholism) and violent behavior. The direct cause explanation applies to all drinking situations and all individuals taking part in these. The conjunctive, conditional, interactive and common cause models explain the statistical association by introducing a third variable which varies independently of the other two, and which is not necessarily present in all drinking situations. Thus it allows for the possibility that not all relevant\* alcohol use increases aggressive tendencies. The association is explained by showing that it exists in one or more subsets of alcohol use situations (alcoholics).

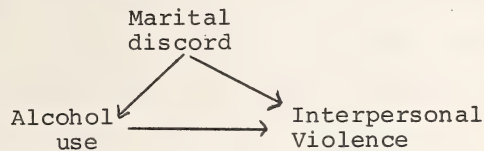
The status of intervening variables is somewhat



different from the other types of variables discussed above. All the other variables (except, of course, the dependent variable of violent behavior in the direct cause relationship) can vary independently of the independent variable (alcohol use or alcoholism). An intervening variable, on the other hand, must by its very nature have strong positive correlations with the independent variable, if the relationship between the independent and dependent variables is positive. This is so because intervening variables further specify the causal nexus without affecting the strength of the original relationship between the independent and dependent variables. (For an illustration of the role of an intervening variable in explanations of the association between alcohol use and violence, see the illustration of an explanatory model below.) The intervening variables if they are to specify a relationship between, e. g., an independent and a dependent variable, require that the independent variable is better specified than what usually is the case. Common variables such as "sex", "social class", etc., are not well specified, even as to the system of variables to which they belong, i.e., if they are social, psychological, physiological, etc. "Sex" of drinker, for example, is not a well specified variable, but designates an empirical conglomerate of several variables from several fields of inquiry. Introducing intervening variables requires more specificity since the intervening variables will be different according to what aspect of being male or female is causally relevant in the context.



The causal relationships discussed above may be combined in any number of ways in causal models linking alcohol use (or alcoholism) to violence. For example, the direct cause and common cause relationships may be combined in the following way:



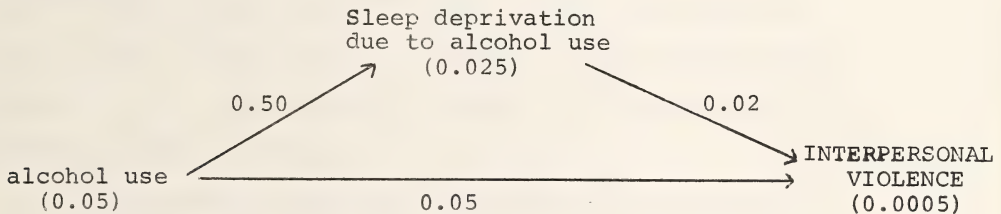
In this illustration marital discord increases the probability of both alcohol use and interpersonal violence. The alcohol use further increases this probability through its direct effects.

For the purpose of accounting for the relationship between alcohol use (or alcoholism) and violence it will be useful to illustrate what a "complete" causal explanation of the statistical association would look like on the aggregate epidemiological level. As an illustration I will use a simple linear model to show how the explanatory share of each model in accounting for the association depends on two factors. The first of these is the prevalence of certain conditions, most importantly the independent variable of alcohol use and relevant conditional, interactive, and common cause variables. The second is the strength of the causal relationship. In the illustration below it is assumed that sleep deprivation as an intervening variable is of explanatory value, and that there is no





interaction between the direct effect of alcohol use and sleep deprivation. Note that the model is not meant to show how much of the variation in the dependent variable is explained by each of the variables (as in path analysis). Instead the probabilities in brackets are probabilities that the factors will occur at any time and the probabilities beside the arrows show the conditional probability of e.g., sleep deprivation occurring if alcohol use has occurred.

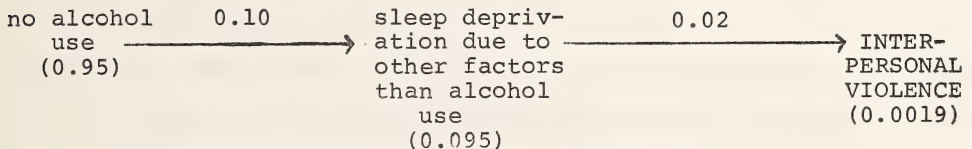


This model would have to be interpreted in the context of each separate culture or jurisdiction or any other population for which we have epidemiological data relating to the association, and most probabilities would differ from culture to culture. In this hypothetical population the probability of alcohol use occurring at any time  $P(A)$  is set at 0.05. The conditional probability over the total population of having significant sleep deprivation effects due to alcohol use has arbitrarily been set at 0.50:  $P(A \rightarrow SD) = 0.50$ . The absolute probability of anyone in the culture being deprived of sleep due to alcohol use is then  $P(A) \times P(A \rightarrow SD) = 0.025$  at any time. In the illustrations the conditional probability of interpersonal violence occurring if sleep deprivation occurs is 0.02:  $P(SD \rightarrow V) = 0.02$ .



Thus the probability of interpersonal violence occurring due to the sleep deprivation effects of alcohol use, assuming no interaction between variables, is  $0.025 \times 0.02 = 0.0005$  at any time.\* The conditional probability of the effects of alcohol on interpersonal violence via other intervening variables (which have not been specified here) has been set at 0.05. Thus the probability of interpersonal violence in alcohol use situations due to other causal relationships connected with alcohol use will be  $0.05 \times 0.05 = 0.0025$ , and the probability of interpersonal violence in the situations when alcohol is used will be  $0.0025 + 0.0005 = 0.003$ .

A corresponding model of interpersonal violence due to sleep deprivation effects pertaining to the same population in situations when alcohol is not used could be the following:



The situations when alcohol was not used will occur 95% of the time (since we assumed that alcohol was used 5% of the time). The probability of interpersonal violence due to sleep deprivation will be the same (0.02). Consequently, the probability of interpersonal violence in situations where



alcohol is not used will be  $0.95 \times 0.10 \times 0.02 = 0.0019$ .

Let us assume, for illustrative purposes, that sleep deprivation is the only causative factor in violence in non-alcohol conditions. We can now arrive at the proportion of violent acts which are connected with alcohol use, out of all violent acts committed. The probability of violent acts being committed in this population is 0.003 in alcohol use situations and 0.0019 in situations where alcohol is not used, and thus the probability of violent acts at any time is  $0.003 + 0.0019 = 0.0049$ . Assuming that the administrators in this population keep a record of these things (or if they are reflected in an unbiased way in their statistics of violent crime), they will find that alcohol use situations were implicated in violent acts in

$\frac{0.0030}{0.0049} \times 100 = 60.8\%$  of the cases. (This could have been Philadelphia in the early 1950's, see Wolfgang, 1958.)

In this type of model any other kind of intervening variable could be included, e.g., risk taking tendencies or hypoglycemia, (see below). The same type of reasoning could be applied to predispositional variables such as temporal lobe dysfunction or alcoholism. The weights given would reflect the prevalence in the population of these conditions. A complete accounting in terms of probabilities would have to take into account overlapping subpopulations and interaction factors. However, the reasoning is the same in principle: the prevalence of alcohol use situations (or e.g., time spent under the influence of alcohol) and of conditional factors such as having a temporal lobe dysfunction must be known and so must the causal conditional



probabilities of one factor occurring if another independent factor has occurred.

This discussion on the logical and methodological aspects of explanations of the association between alcohol use and violence (or any other statistical association) may seem unnecessarily lengthy. However, an explication of the logic of explanation is needed to fit previous empirical findings into a cumulative body of knowledge and to guide research. These are the logical paradigms we use in (more verbal) explanations and they should be explicated as far as possible, to systematize knowledge and research in an efficient way, and to enable us to see connections and locate gaps in knowledge. If these aspects are not taken into account, we will still be deluged with one or two factor theories making exaggerated claims of their explanatory power, and the research carried out will be limited to bivariate analyses and "direct cause" thinking. We will then also have to be content with logical nonconcepts such as "plays a causal role" or "has explanatory potential".

It should be pointed out that a "direct cause" thinking pervades not only the research methodology or interpretations of individual studies, but the whole outlook on the proper ways of reaching valid empirical results. Instead of looking at selected samples of e. g., males, females, mentally ill offenders or epileptics as biased samples (e.g., Goodwin, 1973) with unknown generalizability to the general population, they should be seen as providing clues as to possible conditional or interactive factors in the explanation of the association between alcohol use and violence. In an accounting of





the relationship the biasing factor should be assigned a weight reflecting the prevalence in the population at risk, and this is the only information that would be missing.

Instead of the impractical and rather wasteful way of trying to get a representative sample of the population at risk, it is in fact more fruitful to select small samples of what, with the present knowledge, seem to be relevant subgroups of the population and subject them to a more intensive study, taking into account the conditional nature of the findings and their prevalence in the population at risk. On the other hand general population samples may be used in a "mapping" function to pinpoint subgroups of the population and situations in which alcohol seems to play a practically significant role in increasing the likelihood of aggressive behavior, and to arrive at prevalence estimates of these subgroups and situations. This potential has not been used at all, it seems.

#### 4. The direct cause paradigm

Unsystematic observations in natural settings (upon which much of our understanding of human activity is based), have not by their very nature yielded any valid information on variables which would be relevant as conditional (or interactive) factors in increasing the probability of aggression or violence in alcohol use situations.

Epidemiological studies with their limited sets of variables and their ad hoc sampling, have not provided much usable information as to conditional variables either. Clinical studies of violent offenders have yielded some limited



information mainly on biological variables which could be conditional in increasing the likelihood of violence in connection with alcohol use, but even this information has been widely ignored in the experimental literature of alcohol's effects on aggression.

Consequently, although we know that alcohol use does not inevitably lead to aggression and only a very small proportion of alcohol use situations lead to violent crime, a direct cause relationship is implicit in much research on the subject. This is the case to such an extent that we can speak of a "direct cause paradigm" which has guided the methodological aspects of experimental research.\* Possible conditional factors have entered the studies only in the interpretative stages, when the results have not borne out the assumptions of the direct cause paradigm. It is also implicitly accepted by those adherents of the "disinhibition theory" of alcohol use, who do not care to specify any conditional factors which would determine the disinhibitory property of alcohol. (I will discuss this "direct disinhibition reasoning" in a separate section below).

In experimental conditions designed under the influence of the direct cause paradigm, extraneous factors which are present in real life situations are controlled, but inevitably new extraneous factors are introduced with the experimental setting. Especially great care is taken to eliminate factors that may have independent main effects on the aggressive behavior (conjunctive variables), such as the



cluster of variables labelled "the social setting". In trying to eliminate these conjunctive factors many factors potentially interacting with alcohol and perhaps leading to an increase in the probability of aggression in natural settings are left out. In explaining negative findings the tendency is then to revive these conjunctive independent variables which have been controlled (and not systematically varied) in the experiment. (It is of course also possible that extraneous factors introduced into the experimental situation, such as the experimental setting, and the inevitable feeling of being under observation, act as suppressors on the display of aggressive behavior.)

The nature of the independent variable has varied in these experiments, but the essentially bivariate research logic determined by the paradigm has not. (This is not true to the same extent in general aggression experiments where more than one variable has often been manipulated to arrive at conditional relationships).

The direct cause paradigm could also be called a "le cas pur" paradigm in its sampling aspect (Galtung, 1967). Since, within the paradigm, the effect of the independent variable on the dependent one is not conditional on values of other variables, the selection of subjects for experiments can be, and has been, quite arbitrary. It has been determined by economy and other practical reasons, which means that the attributes of North American university students have guided the research and explanations in the field.\*





In the following, studies will be included in the discussion of the direct cause paradigm if the possibility of conditional or interactive relationships with alcohol use has not been taken into account in the design of the study, even though they may enter into the interpretation of the findings. Not one of the authors included here lack an awareness of the relevance of conditional or interactive relationships; the inclusion is based solely on the methodology of the studies.

The most clearcut application of the direct cause paradigm is found in animal studies, but even here the findings are not positive in any clearcut way. The lack of conditionality in the methodology of animal studies is probably better justified than in human studies.\* Experiments on the action of alcohol on aggressive behavior have been carried out on laboratory rats, mice, cats, and fish. The most direct study, leaving the least number of interpretations open as to actual conditionality of the relationship, or raising the least number of questions as to intervening variables, was carried out by MacDonnell and Ehmer (1969). The study was not intended to measure the effect of alcohol in eliciting aggressive behavior but to investigate how alcohol modified aggressive behavior which was elicited through cortical excitation (Carpenter and Armenti, 1972). The results were somewhat equivocal; the latency of attack increased with dose, and the only aspect of the attack pattern that seemed enhanced by alcohol was the force of biting. ("Maliciousness" of a violent crime



would perhaps be a farfetched human parallel to "force of biting".)

Weitz (1974) studied rats under three different alcohol conditions and one control condition of isotonic saline. She found a clear negative correlation with increasing amounts of alcohol. Under the lower two alcohol conditions fighting behavior was above the control condition, in the highest condition it was below the control condition, although the difference was not statistically significant. Weitz points out, however, that there were great individual differences among the rats in the magnitude of increase in frequency of fighting behavior. This indicates that conditional factors exist even in this population.

Raynes and Ryback (1970) have reported an increase in fighting behavior among Siamese fighting fish (Betta Splendens) when ethanol was mixed with the water in the fish tank. Bourbon and heavy congener solutions decreased the frequency of these responses compared to non-alcohol conditions. (This seems to contradict the findings by Katkin et al., 1970, below, but here we naturally have to take the "phylogenetic leap" into account.) Schaaf (1971) found that fighting in rats increased with alcohol injection after electric shock. However, even a control injection of isotonic saline led to an increase.

It can be concluded that unambiguous findings as to a general main nonconditional effect of alcohol in increasing aggression can not be found in studies of animal samples. It is significant that experimental results with animal subjects



have not led to interpretations using conditional variables when the results have been negative, as has happened in interpretations in human studies. This shows that there is an implicit assumption that conditional situational and predispositional factors are not as relevant in explanations of animal behavior. Whatever the reason, there is an acceptance of the empirical findings within the direct cause paradigm in animal behavior studies, and no attempts at establishing conditional relationships.

The results in experiments on human subjects have been equally equivocal. In interpreting the results a conditionality of the relationship between alcohol and aggressive behavior has been invoked or conjunctive variables in natural settings blamed for the supposed association. With humans the complexities of controlling for the nature of the independent variable (especially with symbolic aspects added to the possibilities), and all possible conditional factors as well, become immense. As seen in the section on the nature of the independent variable the BAC's, when used as independent variables have been rather standard in experiments on non-alcoholics.

Bennett et al., ( 1969), used a discrimination learning task in a laboratory setting as a pretext for eliciting electrical shocks of varying intensity from the subject towards an accomplice of the experimenter, who frustrated the subject. The subjects were 16 male graduate students who were used in a factorial design. There was only a minimal



tendency towards increased aggression in alcohol conditions over the non-alcohol condition and no linear dose-specific trend. As in many general experiments without an alcohol condition an increase in aggression (shock intensity) was noted with the progress of the experimental sessions for all conditions. In the discussion of their results Bennett et al., (1969) state the possibility that relevant variables of both predispositional (in the selection of subjects) and situational nature (in the controls for extraneous variables by imposing an experimental setting), have been eliminated. It is not quite clear, however, whether the situational cluster of variables of social setting is seen as conditional in order for alcohol use to increase the probability of aggression, or if this cluster is considered to have a main effect on aggression independently of alcohol use. If the latter is the case the observed relationship between alcohol use and violence would be spurious. These alternatives are not exclusive of each other, of course. A third possible explanation suggested by the authors, is in the nature of the independent variable: "It seems safe to conclude that alcohol as a pharmacological agent, in the amounts used here, does not lead to aggression". The authors also see the possibility of another type of causative independent variable; the cue (or symbolic) value of alcohol use: "...alcohol could easily become a cue for behavior that would otherwise be unacceptable, or at least it might become an excuse".





Boyatzis (1974), in an experiment testing the general effects of consumption of beer and a variety of distilled spirits on aggression in a heterogenous sample of 149 males, in natural settings (party settings) found that aggressive reactions increased more with spirits (self-selected gin, vodka, rum, bourbon, scotch and blended whiskey) than with beer, thus replicating Takala et al.'s., (1957) finding. He found that frequency of aggressive behavior increased with the blood alcohol level of the subjects both under the beer and distilled spirits conditions, although there was a stronger tendency with distilled spirits. He also found that over the duration of the occasion aggressive behavior increased. It is probable that this is partly a function of time passage itself and the processes related to it since there was an increase of aggressive reactions over time also during a control condition where alcohol was not consumed (Bennett et al., 1969; and Buss, 1963). A longer duration of the social occasion could thus be a conjunctive feature of "alcohol use" with a main effect of its own on aggressive behavior in natural settings.

In an earlier study, in a comparatively structured social setting, Bruun (1962) using a quasi-experimental before-after design (Campbell and Stanley, 1963), found that aggressive reactions increased in male drinking groups with rising BAC levels (and duration of the drinking occasion). Takala et al., (1957) in a similar setting found that alcohol increased aggressive behavior in their male drinking groups. Different BACs ranging from about 0.09% to .0.15% did not significantly



differ in the degree of aggression produced. They also found that beer produced less aggression than spirits with equal BAC's. I will discuss these experiments further in the section on predispositional factors below. Shuntich and Taylor gave 30 college males 0.9 ml of 100 proof bourbon/kg of body weight in an experiment using the "aggression machine". Subjects in the bourbon condition delivered significantly more severe electric shocks to their presumed victims than did the subjects in the control condition.

In Shuntich and Taylor's (1972) experiment, as in the free choice experiments in natural settings, it is not possible to tell apart possible effects of the absolute alcohol consumed and the congener effects. Experiments using congener content as independent variable have generally used atypically high congener concentrations. Katkin et al., (1970) showed that risk-taking, which could be an intervening variable to aggression, in a hypothetical situation, was higher in a bourbon condition than in a vodka and synthetic alcohol condition. Bourbon has about one hundred times the congener content of vodka. For the experiment the congener content of both bourbon and vodka was increased fourfold. In experiments comparing e.g., beer and distilled spirits (Takala et al., 1957, Boyatzis, 1974) different cue values or cultural definitions and meanings of these beverages cannot be ruled out, in addition to any congener effects and the volume of liquids imbibed.

In general, it seems that the studies in which a whole social drinking situation has been the independent



variable the probability of aggressive behavior has increased with drinking to a greater extent than in controlled experimental settings with a closer specification of the independent variable. Again, we have to allow for the possibility that the longer duration of these natural settings can be causally relevant. Only in the series of experiments reported by MacClelland et al. (1972), and the study by Boyatzis (1974) was it attempted to introduce a control condition with no drinking.

A great difficulty in designing experimental research lies in deciding which factors are only conjunctive and may have an independent main effect on aggression and which are also interactive or conditional to alcohol use in producing aggression. A systematic surveying and analysis of situations and individuals which are implicated in violent behavior is needed in order to find relevant conditional and interactive variables. This is where social and epidemiological research can help and where cooperation is essential.

A great drawback of the direct cause paradigm is that it tends to draw away attention from the need for a systematic variation of potential conditional factors. However, the studies reviewed here are of value as attempts to specify the nature of the independent variable. The experiments using BAC's or amounts drunk have shown that there are no clear linear effects on the measures of aggression used. It should be added that this has been shown within the limited range studied.





A simple linear relationship between blood alcohol concentration and risk of becoming an offender in a crime of violence or an aggressor, should not be expected, even if causal relevance were established. One reason is the impairment associated with high BAC levels. Unfortunately, there are no data available on the relationship between BAC level and ability to aggress e.g., verbally or physically. The only studies approaching this relationship in any relevant manner are the ones on the impairment caused by alcohol on some psychomotor skills, especially driving skills (e.g., Cohen et al., 1958). The level of skills needed in crimes of violence would seem to depend on many situational factors, such as the type of weapon accessible, the characteristics of the victim, etc. For this reason it is very hard to speculate about the relevance of psychomotor experiments of the type carried out to date on physical aggression and violent crimes.

a. The "disinhibition" fallacy

The experiments carried out under the direct cause paradigm (using different independent variables) have been viewed by some investigators as tests of the "disinhibiting" effects of alcohol (Bennett et. al., 1969; Shuntich and Taylor, 1972). The direct cause model is in effect identical to what I shall call " the direct disinhibition model" in the discussion below. This is indicated by Bennett et. al.'s (1969) interpretation of their own findings. Their experiment tells us in fact that the direct cause explanation is not true, (using their specification of



independent variable) it does not hold true for all individuals over all situations. The authors see the negative results as not supporting the disinhibition theory of alcohol in relation to aggressive behavior. It does, however, only refute a variant of the disinhibition theory which states that all individuals (no matter what their predispositions and characteristics) have at all times (whatever the characteristics of the situation) aggressive inhibitions which are always released by alcohol. Another variant of the disinhibition theory has been analyzed by Carpenter and Armenti, (1972). Before going into these two variants and a closer analysis of the "disinhibition" concept, it is instructive to look at the semantical labels for the idea of disinhibition which have cluttered the literature and obscured a lack of valid empirical data.

The prevalence of the "disinhibition" concept and more or less equivalent concepts in the explanation of the behavioral effects of alcohol is very high. Alcohol is labelled as an agent that "weakens inhibitions" (Fitzpatrick, 1974; Roebuck and Johnson, 1962), "weakens self-control" (Macdonald, 1961); "releases inhibitions" (Shuntich and Taylor, 1972); "liberates impulses and emotion which are normally under control" (Hopwood and Milner, 1940), "liberates deep features of the personality" and consequently "awakens aggressive tendencies" (Medina, 1970). It "reduces inhibitions and self-control", and leads to a "loss of inhibitory capacity and subsequent unleashing of personal predilections" (Hopwood and Milner, 1940), it has a "disinhibiting effect" (Scott, 1968).



It is known as a "disinhibiting, aggression-provoking substance" (Brill, 1970), "as a trigger of violence" (Blumer, 1973). Its pharmacological role is described as that of "releasing aggression, removing inhibitions, etc." (Glatt, 1965).\* The examples could be multiplied, but would not add much to the knowledge of the role of alcohol use in aggressive or other types of behavior alluded to as "disinhibited". It is an old concept and has been used over the centuries in discussions of the effects of alcohol use at least as far back as from the time of Plato (MacAndrew and Edgerton, 1969). This should be kept in mind, if it seems that it is always legitimately used in referring to a specific model of the pharmacological actions of alcohol on the central nervous system.

A fact which should arouse one's suspicions is the general acceptance of such a concept (and purported explanatory model) by researchers and other individuals from so many diverse fields: medicine, experimental psychology, psychiatry, anthropology, alcohol epidemiology, sociology, etc. It could of course be seen as an indication that an explanatory disinhibition model has become so firmly established by research that it is almost universally accepted. On the other hand, knowing that this is not the case, one should ask whether all who seem to accept such a model really (comparing their backgrounds) can have the same explanatory model in mind. One possible explanation is that the disinhibition concept which seems to be used in an explanatory function by many authors, actually is used to describe behavior which is known to occur or have occurred in a proportion of alcohol use





situations, behavior which is described as being "disinhibited" or "uninhibited" in common use of language.\* Everyday descriptions of behavior are common to people from all types of endeavor.

A concept of such widespread use has not been without its detractors, both in its descriptive aspect and its explanatory use. MacAndrew and Edgerton, (1969) question the applicability of the concept to describe behavior in connection with alcohol use: "How, we asked, can we square the notion that alcohol is a toxic disinhibitor with the fact that societies exist whose members' drunken comportment either a) manifests nothing that can reasonably be classified as "disinhibited"; or b) is markedly different from one socially ordered situation or circumstance to another?"

In order to understand the widespread use of the concept in explanations of behavior in many fields, it must be assumed that it cannot have had much empirical content. It will be suggested below that in its explanatory use the "disinhibition" concept is not the label of a specific model that it is widely assumed to be. Its foremost use is as a type of label for certain formal properties of definite sequences in explanation. It is possible that this explanatory use and the descriptive use of the concept have been confused at times. I will expand on this possibility below.

To understand the concept of disinhibition in its explanatory use we must understand that alcohol is not the





only independent variable which can be characterized as a "disinhibitor". In fact all possible independent variables with main, conditional or interactive effects on behavior in the alcohol use situation can be so described. This is so because "disinhibition" is not an empirical aspect of an explanatory model. Instead its use is dependent on extra-explanatory factors, specifically the set of situations that one uses as a starting point in one's reasoning and one's research. If one, as usually is done, starts with a situation in which all the conditional variables have the needed values and introduces alcohol and this causes a significant increase in aggressive behavior, it seems natural to call alcohol a "disinhibitor" as "releasing" or "triggering" aggression, etc. On the other hand, one could take as the starting point situations (with or without alcohol) where some other etio-logically significant variable does not have the needed value. This could perhaps be a stress-inducing stimulus or aggressive behavior by another participant in a social setting. If this variable is manipulated so that there is a significant increase in aggressive behavior, this variable could just as well be called a disinhibitor.

The disinhibition concept has been interpreted as implying that there are pent-up emotions or biologically determined aggressive tendencies which are usually inhibited but released in alcohol use situations (e.g., Rada, 1975). However, in a methodological and explanatory framework these factors do not have a special logical status. They are conditional



variables of a predispositional nature on par with any other predispositional variables needed in the explanation of the relationship between alcohol use and violent behavior. The same type of conditional relationship with violent behavior may exist between variables other than alcohol use. It could, for example, be the case that pent-up emotions in non-alcohol situations in order to be causally significant must be combined with stressful stimuli (in lieu of alcohol) for violent behavior to occur. Thus, stressful stimuli would be the disinhibitors. Consequently, even if we see the disinhibition concept as referring to a conditional model, other conditional factors beside alcohol use can be called disinhibitors, or releasers etc., of aggression. Any of the conditional factors of a situational type in the set of variables which are relevant for the occurrence of violent behavior (in addition to alcohol) could in fact be labelled the "disinhibitor". Thus, the "disinhibition" model on the basis of a closer analysis ceases to be a distinct, formally identifiable explanatory model, since the concept in its explanatory interpretation does not refer to anything that is not covered by general causal considerations, except the extra-explanatory feature of which set of situations is used as a starting-point in the explanation, and consequently which variable is chosen for an analysis as to its impact on the occurrence of the independent variable. It is to an even lesser extent one empirically verified or even testable model. Calling alcohol a "disinhibitor" does not add any explanatory power to a model. This statement only says that alcohol is one among the variables,



which - in conjunction with others - increases the probability of violent behavior and reveals a predilection for a special extra-logical sequence of reasoning which perhaps is determined by the cultural salience of alcohol.

Situational variables, i. e., variables that can vary intraindividually and are not more or less fixed as predispositions of the individual, run the risk of being labelled "disinhibitors". In experimental situations the only variables that can be manipulated are situational. If the investigators focus on alcohol use as the main independent variable, it will by necessity be seen as the potential disinhibitor, without this having any relevance for a possible specific (physiological or any other kind of) "disinhibition mechanism". Alcohol is by necessity seen as a potential disinhibitor, because the experiment is set up to test this proposition. If stress were the main factor manipulated independently with alcohol use constant, it would be the potential disinhibitor, and we would have a disinhibition "model" of stress "explaining" aggressive behavior, without adding anything to the explanation that is not already there in the experimental set-up and the empirical findings. The fact that alcohol has a traditionally well-known connection with physiological changes should not stop us from seeing that the disinhibition concept is used in this rather formal manner and that alcohol as an independent variable just as well could be substituted by stress (which undoubtedly also induces physiological changes, but this is completely beside the point here). Alcohol could be used as a conditional variable and stress as the independent variable and thus as the potential





"disinhibition". This nonempirical, and in a sense both formal and extra-explanatory, property of the disinhibition concept partly explains its wide acceptance and use by authors from a number of different disciplines.

Since Bennett et al., (1969) carry out their experiment under the direct cause paradigm, they also interpret the experiment as refuting a disinhibition model, which can be seen as a special case of the conditional disinhibition reasoning. In this sense, for example, stressful stimuli can also be tested under the direct cause paradigm, i. e., tested for causal effect in all situations for all individuals, and almost certainly also refuted. It would almost certainly be refuted, since only one experiment showing negative findings is needed to refute such a version. The conditional version of the disinhibition "model" is illustrated by Carpenter and Armenti (1972) in an analysis of Hetherington and Wray's (1964) findings. Carpenter and Armenti assume that a disinhibition model entails the existence of an "inhibitor". (The fact that the causal factors of this inhibition of behavior generally are not specified, as Carpenter and Armenti, (1972) point out, is another indication of the formal properties of the disinhibition concept, and again explains part of its attractiveness.) Hetherington and Wray (1964) showed that the only group in their experiment, for which there was an increase in the appreciation of aggressive cartoons after ingestion of alcohol, was the group which had high scores on both need for aggression and need for social approval. Need for social approval and need for aggression (whatever



this entails) are both potential conditional factors in explanatory models, since any "inhibitor" is on par with other conditional variables which in connection with alcohol use increase the probability of aggressive behavior. The fact that this conditional variable was singled out for the status of "inhibitor" probably has to do with the descriptive connotations of the concept. Here the formal use of the concept is combined with its descriptive features and thus it is used for explanation of behavior such as aggression, excessive emotionality, sexuality, i.e., behavior which is normatively regulated and which we generally would characterize as "disinhibited" or "uninhibited". We would use it in this way, and this is an important point, even though we were not to accept a disinhibition model as an explanation for the behavior in question. This use of the "disinhibition" concept could be called "conditional disinhibition reasoning." The lure of this form is that the concept which labels it also is used descriptively (in common language). Thus it may seem that one is subscribing to, and perhaps one is even led to subscribe to, a specific disinhibition model, since one accepts the description of certain forms of behavior as being "disinhibited" behavior. The finding by Hetherington and Wray (1964), shows that a subgroup of the population, the group of socially inhibited individuals who also have a high "need for aggression", exemplifies a conditional factor in the relationship between alcohol use and aggressive behavior.



It should be noted that this is only a special case of the general disinhibition reasoning. It seems that a semantical shift has occurred here, aided by the descriptive connotations of the concept. This use of the disinhibition concept is incidental to its general use.

In summary, it can be said that the disinhibition concept has been used in five different ways in the reasoning on the connection between alcohol use and aggressive behavior:

1) In its descriptive use as a general label for behavior which is contrary to generally accepted social norms and values.

2) As "direct disinhibition reasoning". This can be applied to any explanatory model where a threshold value is needed on an independent variable for the occurrence of an event. No conditional factors are considered causally relevant. Thus, it can be used in the explanation of why the water in a dam starts flowing when the gates are opened. The water was "inhibited" in its potential flow by the dam (the inhibitor). The reason we do not call the action of the water "disinhibited" is that the descriptive use of the concept has anthropomorphic normative connotations.

3) The third use is a combination of 1) and 2) and it is the prevalent one in experimental testing of the "disinhibitory" properties of alcohol. This use explains the "disinhibited behavior" (descriptive concept) by the "disinhibiting properties" of alcohol.\* This is the framework within which Bennett et al., (1969) criticized the



"disinhibition theory" of alcohol use and which in a sense is implicit in the experimental studies using the direct cause paradigm.

4) The fourth use I have called "conditional disinhibition reasoning". In this sense any situationally manipulable variable can logically be the disinhibitor assuming specific values on other causally relevant conditional variables. The resulting values on the dependent variable can not always be characterized as "disinhibited", due to the normative connotations of the concept.

5) The fifth use again is a combination (perhaps it could be called a semantical conglomerate); this time of 1) and 4). Here the conditional variable is such that it can descriptively (in everyday language) be called an "inhibitor", as "inhibiting" behavior and relevant values on the dependent variable can be characterized as "disinhibited". This descriptive use is independent of its use as a label for the disinhibition sequence of reasoning. Hetherington and Wray's, (1964) conditional variable is such that it lends itself to such an application. The observed dependent variable (aggression) can be socially described as "disinhibited" and the "high need for social approval" seen as an indicator of social "inhibition".

In the analysis above our use of language has been in the focus. A basic tenet has been that language is used as a part of different human activities, and that its uses cannot be understood without a reference to these activities (Wittgenstein, 1958). This is true for both everyday language





and the language of the sciences. "Disinhibition" cannot be understood without a reference to experimental methodology and the general logic of research.

We should also note the factors that point towards a formal nature of the "disinhibition" concept:

1) It is accepted by authors in so many and varied disciplines that they inevitably must have very varied substantive empirical models (if any) in mind.

2) It is used to "explain" a wide variety of behavior: kissing, hugging, making love, fighting and killing. This also means that the concept in its descriptive use must be very general and abstract.\*

3) The causal factors in the nascent model are not specified. Such is the case e.g., with conditional variables which could be characterized as "inhibitors" in conditional disinhibition reasoning.

As a consequence of this formal nature, disinhibition "theorists" will be able to say "we were right" whatever the final explanatory model of the connection between alcohol use and aggression is (except if conjunctive or common cause variables explain the connection "away"). They will be able to do so as long as introducing alcohol into any one predetermined set of circumstances increases the likelihood of aggression.

"Disinhibition" as a purportedly explanatory concept is widely accepted no doubt because it hides what it purports to reveal, an empirically testable model for the explanation of human behavior. It is a largely formal pseudo-explanation



which to a great extent rests on common descriptive language for its believability. It also provides a rather mechanistic and simple formula disguising a process which probably is a predominantly conceptual, symbolic activity with many conditional factors of a cultural nature.

Disinhibition theorists are correct in the realization that behavior changes in connection with alcohol use must be explained with a formal model. This will leave specification of the nature of the resulting (affectionate or aggressive) behavior largely up to situational factors. Below, in a section describing the escalation process in the etiology of violent behavior connected with alcohol use, I will outline a formal model with empirical implications of a testable nature to explain the "disinhibiting" property of alcohol use.

##### 5. Situational and predispositional factors of potential causal significance

The conditional and interaction models can be divided into two subcategories, the situational and the predispositional, depending on the nature of the conditional variable. This distinction is of both practical, in terms of prevention and methodological set-up of experiments, and theoretical importance. It is essential to know whether the conditional variables which increase the probability of violent behavior in alcohol use situations vary between individuals, i. e., are stable characteristics of a subgroup of individuals, or



if variations in the frequency of aggressive behavior in these situations can be explained mainly by variations within individuals over time.

In criminology there has been a controversy over historical or genetic views of crime causation as opposed to situational views. Whereas e.g., Sutherland and Cressey (1970), took the position of greater relevance of historical variables in the etiology of criminal behavior, others have emphasized the importance of situational factors. Among the latter, Gibbons (1971-72) speaks for the existence of a type of criminal that he labels "situational-causal": "...in many cases, criminality may be a response to nothing more temporal than the provocations and attractions bound up in the immediate circumstances".

One of the clearest statements for a situational paradigm in the study of violent behavior can be found in Shoham et al.'s, (1974) study on the escalation process in violence. "... biological, psychological, psychoanalytical and sociological aspects of violence are less relevant to the explanation of violence than the actual chain of events leading up to the violent act".\* There seems to be no doubt, however, that there is interaction between predispositional variables and situational ones, so that even in a situational explanation of violence the values on predispositional variables (e.g., characteristics of sampled individuals) should ideally be specified.





Here our concern is with explaining the relationship between alcohol use and violence. Thus, situational factors cannot be used as independent variables except as they are relevant in explaining away the relationship by using them as conjunctive to alcohol use or as common cause factors causing both aggressive behavior and alcohol use. If this is not possible, situational factors enter explanations here only as conditional variables which bring about a greater probability of aggressive behavior in alcohol use situations than expected by a null hypothesis.

It seems probable that in many valid explanatory models, where alcohol use in some of its aspects is the independent variable, both situational and predispositional variables must be included. A specific subgroup of the population will behave aggressively only in certain types of situations. This has been acknowledged by many writers in the field, especially by experimental psychologists (e.g., Bennett et al., 1969 ; Kastl, 1969 ; and Hetherington and Wray, 1964 ). Indications of interactions between situational and predispositional variables in producing aggressive behavior in connection with alcohol use are not hard to find in clinical studies. For example, Bach-y-Rita et al., (1971), state that in their sample of violent patients: "... small variations in the environment provoked massive repercussions.". The task for research is to specify the subpopulations and relevant situations.



There have been no systematic attempts to manipulate both predispositional and situational variables in the same experimental studies where alcohol use has been the independent variable and aggression the dependent variable. Most studies have been carried out under the direct cause paradigm and any conditional factors, predispositional or situational, have been introduced incidentally or at the stage of interpretations. Consequently, the discussion below has to restrict itself to a discussion of possible conditional variables, without systematically attempting to put them into any relation to each other.

a. Situational variables

Our definition of the set of situational factors is the following: Situational variables are variables the values of which show intraindividual variations over time, and only to a smaller extent relatively stable interindividual variations. The data are rather scant and a basic weakness is that few studies have been made in natural settings successfully comparing a non-alcohol condition with an alcohol condition. Consequently, it is not possible to assess the importance of the conjunctive main effects of relevant variables relative to their conditional (or interactive) value. Therefore, the discussion below will deal with conjunctive and conditional variables in the same subsection. Secondly, a number of variables will be reviewed which seem to be causally relevant in the accounting of the relationship as intervening variables, and thirdly, situational variables



will be discussed which could explain away the association by explaining both the occurrence of the alcohol use situation (or a specific type of alcohol use situation) and the display of aggression.

(i) Conjunctive or conditional variables

Situational variables have been invoked in the discussion of findings in studies using the direct cause paradigm. As seen above, Bennett et al. (1969) have discussed the causal role of the "social setting". It is not clear, however, whether they exclusively see it as the main effect variable just conjunctively related to alcohol use because of its social nature in most cultures, or whether they regard it as a conditional factor interacting with alcohol use to produce violence. Carpenter and Armenti (1972) in reviewing the experimental studies seem to suggest that the main effect of the milieu variables (conjunctively) explain most of the connection: "It appears that the circumstances of drinking produce greater changes in behavior than the alcohol does."

"Social setting" is not a variable, but a set of variables. (One sign of this is that it does not make sense to ask for a measurement of "social setting" or for its value.) The lowest common denominator of all social settings (and perhaps what sometimes is meant by "social setting" in the literature) is the presence of other persons, whether in interaction or not. Hartocollis (1962) in his



experiment on fifteen males employed as psychiatric residents at a hospital injected diluted ethyl alcohol in the amount of 1 cc. per kilogram of body weight. He found that the subjects who were tested in groups were "more elated, boisterous and aggressive" than the subjects tested individually. Among the latter no one showed signs of hostility. They were, on the contrary "unusually friendly to those around them". It should be noted that no control or comparison groups getting a placebo injection and subjected to both individual and group conditions were part of the research design. Because of the lack of a control group, it is not possible to determine whether interaction with or presence of other individuals in the situation had any main effect on the increased display of aggression independently of the alcohol effects and whether there was an interactive or conditional relationship between alcohol use and the specific setting.

Beside the conglomerate of variables referred to as "social setting" (by Kastl, 1969 ;Bennett et al., 1969 ;and others) not many potential conjunctively effective factors have been mentioned in the literature. Moreover, the relevant variables in the social setting have seldom been specified, and never systematically studied in studies using alcohol use as one variable. Carpenter and Armenti, (1972) mention male drinking company as a possible causative conditional variable. They also suggest (in discussing the findings by Kalin et al., 1972) that the social situations must be such that they have "a minimum of organization forced on them"





and that in experimental situations it may be necessary to "provoke aggression by movies, harassment, personal insult, etc., before alcohol has any effect on human subjects studied in the almost isolated conditions of the individual context." In psychological experiments using the "aggression machine" the frustration-aggression paradigm is used in provoking aggression. Strangely enough, no attempts seem to have been made to take this paradigm into account in explaining the findings.

The possible conditional nature of frustrating or stressful stimuli have not been elaborated on (except by Boyatzis (1974) in a short discussion), although this is what these experiments presuppose. Stressful stimuli could interact with alcohol use to produce a higher probability of aggression in alcohol as opposed to non-alcohol situations. Consequently, even in many of the experiments that have been carried out under the direct cause paradigm, this potential conditional relationship has existed. (Using the terminology of Carpenter and Armenti (1972), in their discussion of MacDonnell and Ehmer's study (1969), one could say that the experiments study the effect that alcohol has on modifying the relationship between frustration and aggression.) This limitation has not been taken into account in discussing the generalizability of positive findings and the reasons for negative findings.

What, in fact, has been tested is an interaction effect of alcohol use and frustrating or stressful stimuli



versus the main effects of frustrating stimuli (in the control condition). It is, of course, impossible to test the effects of alcohol in a stimulus-free situation, since such a situation does not exist. This type of stimuli, however, is only one among many conditional situational variables that could be used in experiments on the effect of alcohol on aggressive behavior, and the generalizability is restricted to natural settings where frustrations exist.

There are (at least) three ways in which alcohol use situations could enter into the frustration - aggression model and explain an increased probability of violent behavior.

1. One type of explanation would assume that the relationship between alcohol intake and aggression is a spurious one. This would be the case if there were a greater probability of frustrating stimuli in a significant number of natural alcohol use situations. Thus the increased number of frustrating stimuli would be a conjunctive variable whose independent main effect would explain the increase in aggressive behavior.

2. If the aggression threshold is lowered in alcohol use situations, quantitatively less frustration is needed to elicit aggression. The lowering of the threshold could be due to e. g., pharmacological effects of alcohol and/or the social definition of a significant number of alcohol use situations. This is a direct cause model using aggression threshold as an intervening variable, and connections with "disinhibition" models are obvious.



3. The perception of frustrating stimuli could be heightened not only due to quantitative changes in the aggression threshold or the number of frustrating stimuli ; the perception of cues in alcohol use situations (partly due to pharmacological effects) could have changed qualitatively, so that cues which would not be interpreted in any way negatively in a sober state may be so interpreted in an intoxicated state due to a change in the conceptual model applied to the environment.\*

Any combination of these three factors could, of course, be involved in explanations of subsets of violent behavior and violent crime. It should be noted that the frustration-aggression theory is not sufficient for explanation of all violence, whether in connection with alcohol use or not. It is a predominantly situational explanation, and there are numerous studies pointing toward the causal relevance of non-situational predispositional factors. It presumes an escalatory process (never systematically studied) with little, if any, rational planning. Most experimental studies on aggression are based on this paradigm and thus experimental evidence and explanatory models of rationally planned aggression are hard to come by.

Let us after this digression return to other possible conditional or merely conjunctive variables in the social setting. A conjunctive variable of possible causal import is the nutritional habits of the users of alcohol. In some cultures drinking occasions are frequently prolonged, lasting





two or three days or longer (and in any culture this is true of alcoholic drinking). If sufficient nutrition is not taken during alcohol use, there will be an increased risk of hypoglycemia (e.g., Moynihan, 1965). Hypoglycemia in its turn "from whatever cause is, in many cases, associated with tendencies to hostility", (Moyer, 1971). If bad nutritional habits and alcohol use coincide, this will explain an association between alcohol use and aggression. Hypoglycemia can also be seen as an intervening variable to the extent that alcohol use increases the probability of insufficient nutrition. (See section on explanations of the association between alcoholism and violent crime.)

(ii) Potential intervening variables

If one were to revert back to 19th century psychological categorizations it could be said that alcohol use affects all principal psychological faculties: perception, affective state, cognition and (as a sedative) conative functions. All of these are relevant to the occurrence of violent behavior. I have chosen to treat as intervening variables those variables that do not measure aggressive behavior directly, but have been shown to increase with alcohol use, and may be causally relevant in explaining violent behavior.

McClelland, Kalin and coworkers (Kalin, 1972 ; Kalin, et al., 1972 ; McClelland and Davis, 1972) carried out a series of studies designed to measure emotions and fantasy themes in social drinking situations. They found



in the analysis of both TAT projective test results in drinking situations and folk-tale themes, that increased drinking was correlated with aggressive fantasies. The social settings for drinking were stag parties and mixed parties. We can view aggressive fantasy themes as indicators of aggressive tendencies. These quasi-experiments are methodologically similar to other small group studies which have used behavior measures as dependent variables. Kalin et al. (1972) make no unwarranted claims of the generalizability of their findings outside their specific social settings and vary these along some variables. Kastl (1969) used medical students as subjects in an experimental setting. He found that alcohol ingestion had no effect on measures of aggressive impulses, and he attributes the findings of Kalin, McClelland and coworkers to the main effects of the setting. Another possibility is, of course, that there is a conditional or interactive relationship between "social setting" and alcohol use that will increase the likelihood of aggressive fantasies. Wilsnack (1974) used some rather inferential measures for her dependent variables, in a partial replication of McClelland, Kalin and coworkers' studies, with female subjects in a social setting. She interprets her findings as showing that women in alcohol use situations experience more fantasy themes concerned with feelings of womanliness, and not with power feelings. Wilsnack's explanation for the increase in such themes after drinking invokes physiological sensations as intervening variables. She suggests that sensations of "physical warmth" caused by alcohol ingestion "may be elaborated by women into feelings



of emotional warmth and affection". (There is a semantical link here, but is there an empirical link?)

It thus seems that different subjects in different settings experience different types of imagery and feelings in connection with alcohol use. A pattern seems discernable, however. The first clue to the pattern is found in Kastl's (1969) study in which he also measured changes in mood with the Nowlis Mood Adjective Check List under three different alcohol doses. Interestingly enough, there were no systematic changes over dose on any of the twelve moods studied, with the exception of one. This was the mood labelled as "happiness". A superficial phenomenological analysis of the concept of "happiness" indicates that it is without outer reference as opposed to e. g., "power" feelings, "aggressive" feelings, "sexual" feelings, etc., which require a semantical reference to one or more individuals towards whom feelings of "power", etc. are directed. If we accept the causal importance of the social setting in determining the emotional and behavioral consequences of alcohol use (and there is good evidence for this in the studies that we have discussed), we can start out with this embryonic mood of happiness or well-being, and build up a possible explanatory model. The feelings of wellbeing could be caused by the pharmacological effects of alcohol. These feelings then could be projected into the situation to fit the cues that are salient in the situation. Pleasurable feelings in males may in an all male situation be connected with feelings



or thoughts of aggressive power and in mixed situations with concerns of sexual power and conquest. Among women, the most "natural" projection of pleasurable feelings especially in a mixed social situation could be with thought associations related to being womanly. A social situation will be structured according to status or power in the individuals who have a predisposition in this direction, and derive pleasurable feelings from power. In other types of situations the feelings of wellbeing would be "interpreted" according to the salient features of that situation, and the results of a projective test administered in a mixed male-female situation will be determined by a mental structuring experienced as pleasurable in that type of situation. (We may thus have another interpretation of why men and women drink.) In Kastl's (1969) study, the situational cues were not adequate for a structuring based on the feelings of "happiness" into a sexual or aggressively competitive framework since he used an experimental setting and his measures on these variables did not show any changes over alcohol dose. In Hartocollis' (1962) experiment, the all male group situations were structured according to the salient features of the setting and thus according to aggressive power features. In the "individual" situations, it seems that there was interaction between the subject and an attendant or nurse (full information is not available). The projection of the feeling of wellbeing possibly led to a quite different phenomenological structuring of the situation and a different behavior. Perhaps





the structuring in a dyadic situation is more like an "intimate friend" relationship, which is a paradigm of pleasurable feelings in these situations.

There could well be great individual differences, which may depend on psychological factors, social learning, etc., in the projection and external specification of the feeling of wellbeing. In other words, the variables which determine what structural and other factors of a situation are experienced as salient for the feelings of wellbeing, are determined both by idiosyncratic situational factors (such as the composition of the group) as well as more stable personal characteristics of the drinker. (The above analysis is a way of "explaining away" the specificity of feelings as a cause and effect of drinking and to get away from seeming contradictions in empirical findings. It incorporates several empirical findings into the same theoretical model.) It is possible that in some cultures all drinking will become connected with feelings of power via learning processes if drinking is carried out almost exclusively in social situations where the power structure is a salient feature.

The status of power concerns (or, more operationally, thematic physical aggression in TAT projective stories) as intervening variables, has not yet been elaborated on here. The definite semantical link between "power" and "aggression" is a handy shortcut, but our attention should be directed towards establishing an empirical model for



social settings. For this purpose a short exposition of one possible model may be useful. First, let us look at the concept of power and try to explicate its links with behavior. Max Weber's analysis of power as the probability of actualizing one's wishes and commands has been widely accepted. Using it, we could take "power concerns" to imply that the individual is concerned with having his wishes fulfilled in the situation. The somewhat different intervening variable of power feelings would probably mean that the person feels that he has power, and thus the right to expect other individuals to comply with his wishes. Either variant of the intervening variable could be used in a stochastic model of overt aggression in interpersonal situations. In a predominantly male drinking situation in a certain type of culture, a significant number of individuals will be concerned with the power aspects of the immediate situation. (The predominance of immediate situational cues can be expected because of the "here-and-now" character of perceptions under the influence of alcohol. A relatively high share of "inner cues" after alcohol ingestion will have led to a greater salience of power concerns and any other psychological states. These characteristics of alcohol effects will be discussed in the next section.) The greater the proportion of people displaying power concerns and resulting attitudes and behavior, the smaller will be the probability of compliance with any one's wishes. The lack of compliance will be frustrating stimulus and under the frustration-aggression paradigm we can thus



expect more overt aggression in the situation . This kind of sequel could then start an escalatory process culminating in violence (see next section). The point which I want to illustrate here is that we have to look at group processes in order to explain a subset of alcohol-related violence.

An intervening variable more directly related to behavior is "risk-taking". It is a tendency towards behavior which may lead to obnoxious stimuli as outcomes, but which also promise rewards to a greater extent than other alternatives open in the situation. For discussions of the concept of risk-taking, see Cohen et al., (1958) and Katkin et al., (1970). Lemert (1967) has argued that many forms of criminal behavior show characteristics of risk-taking behavior. To the extent that crime can be seen as a subcategory of this type of behavior, and risk-taking behavior tendencies as a variable etiologically relevant in accounting for violent crime, the general literature on the association between alcohol use and crime generally (discussed briefly in Part 1 of this chapter) is relevant in this context. Many suicides and suicide attempts probably also include elements of risk-taking behavior. The expression "Dutch courage" shows that the effects of alcohol use on risk-taking behavior are well established in common lore. However, the experimental studies carried out fail to show any clearcut effects of blood alcohol level or amounts ingested (Sjoberg, 1969; Katkin et al., 1970; Hurst and Bagley, 1972; Cohen et al., 1958). There are undoubtedly differences





between cultures in the extent to which drinking situations are defined as risk-taking situations (or, more generally, "time out" situations). A model similar to the one presented above and substituting risk-taking tendencies in social settings for power concerns as intervening variables between alcohol use and aggressive behavior could no doubt be constructed. Both of these models would then illustrate processes which on a more superficial level are labelled as a conditional relationship between alcohol use and social setting or as an interaction between the two variables. The model of the escalatory process in alcohol use situations, which will be discussed in the next section, is also an illustration of the same formal concepts.

A potential intervening variable which does not have the semantical links with aggression that power concerns and perhaps risk-taking does, is sleep deprivation and specifically REM-sleep deprivation. There are numerous studies showing the effects of alcohol in different amounts and the effects of withdrawal from alcohol on both general sleep deprivation and specifically REM-sleep deprivation (Knowles et al., 1968 ; Gresham et al., 1963 ; Greenberg and Pearlman 1967 ; Gross and Goodenough 1968 ; Yules et al., 1966 ; Johnson et al., 1970). The results show that increased doses of alcohol and consequent increases in BAC's lead to increasing sleep deprivation, fragmentation of sleep and a lower proportion of REM-sleep out of total sleep time both in alcoholic and non-alcoholic subjects. After prolonged alcohol use in larger doses there is often a rebound in REM-sleep



activity. Smaller doses of alcohol seem to lead to a decrease in REM initially, but if the same dose is repeated over several nights REM-sleep rebounds and then returns to normal levels. In non-alcohol experiments where sleep deprivation has been the independent variable it has been found that deprivation of REM-sleep leads to an increase in irritability and anxiety (Gove, 1969-70). Hallucinations, delusions and illusions sometimes reaching psychotic proportions have been noted in long periods of sleep deprivation (Tyler, 1955; Dement, 1960; Berger and Oswald, 1962; Fisher and Dement, 1963; Kollar et al., 1969). (It has been suggested by Gove (1969-70) that sleep deprivation could be an important etiological factor in the psychotic disorganization of the mentally ill.) An increase in irritability and aggression has been documented in several studies of sleep deprivation (see Gove 1969-70), and Moyer (1971) suggests that it is one cause of "irritable aggression" in man. Bach-y-Rita et al., (1970) mention inability to sleep as a frequent etiological factor in ten men who had committed violent acts under the influence of alcohol and were diagnosed as cases of pathological intoxication. In addition to the etiological significance in delirium tremens which has been suggested by Gresham et al., (1963) among others, deprivation of REM-sleep could thus be causally relevant in (some cases of) pathological intoxication.\* It is evident that alcohol use and consequent sleep deprivation, specially of REM-sleep, can lead to potent psychological and consequent behavioral disturbances. This can happen



through the main effects of both alcohol intoxication and lack of REM-sleep and the interaction effects of these two conditions.

In accounting for the connection between alcohol use and violence, sleep deprivation can be regarded as a pre-dispositional factor, if there is an interaction effect between sleep deprivation and alcohol use in causing aggressive behavior, and not merely main effects of alcohol use and sleep deprivation. Thus, sleep deprivation which occurs independently of alcohol use can be relevant for a causal accounting of the connection. Studies determining main effects and interaction effects in the causal scheme relating alcohol use, sleep deprivation and aggression still remain to be carried out.

In cultures and subgroups of the population where large amounts of alcohol are drunk over an extended period of time, sleep patterns will become irregular and perhaps interrupted by withdrawal stages and these actions and interactions may explain violent behavior in these circumstances. In these cultures we may expect a relatively strong association between alcohol use and violent crime. Finland, for example, is historically a country of low alcohol consumption, which implies that the null hypothesis of a chance association between alcohol use and violent crime is comparatively low. The association between alcohol use and violent crime in Finnish samples, however, is higher than for the United States which has had a much higher per



capita consumption and thus presumably a higher null hypothesis. The modal pattern of prolonged weekend drinking (Kuusi, 1948; Sariola, 1954; Kuusi, 1956; Pernanen, 1965) in a comparatively large subgroup of the male Finnish population may account for part of this difference through sleep deprivation effects.

(iii) Situational common cause explanations

Some factors that vary intra-individually over time can partly explain both the occurrence of the acute alcohol use situation and the increased probability of aggression in the situation. To the extent that these models explain a subset of violent crime in connection with alcohol use, the relationship would be spurious. A common cause model can incorporate the findings by McClelland and Kalin and their coworkers (1972) and Wilsnack (1974), and Boyatzis (1974). The first-mentioned team, among males in drinking situations, and Wilsnack (1974), in females, found that heavier drinkers in the situation were more likely to show power concerns even before drinking than were lighter drinkers. It is possible that individuals who are aggressively aroused before a drinking situation (or have a predispositionally aggressive personality, see section on predispositional variables) would tend to drink more and, with or without the main effects of higher alcohol use, would exhibit more aggressive behavior. The correlational finding by Irgens - Jensen (1971) that non-alcoholic and alcoholic men who drink heavily consider themselves more masculine, could perhaps be fitted into this





explanatory scheme. More correlational evidence is afforded by Gibbens and Silberman, (1970) in their prison study. They found that heavy drinkers were more often muscular than were other prisoners. This evidence is very inferential for our purposes, however. Zucker (1968) studied high-school students on a scale measuring masculinity. He found that the heaviest drinkers among the male students were significantly more masculine than moderate drinkers. Moderate drinkers were no more masculine than nondrinkers on the scale. It should be noted that age and social class differences could explain the differences.

Macdonald (1961) suggests that consumption of alcohol and homicidal behavior both may be caused by psychological conflict. Stress situations in general may give rise to both (excessive) drinking and aggressive behavior. Correlational information exists which would fit into such a model (e.g., Linn and Stein, 1944), but by itself such information is not enough and experimental studies of drinking, aggression and systematically varied stress are needed. It seems likely that a drinking spree and a subsequent violent act can both be determined by e. g., marital discord, and arguments in general as stressful stimuli. The interaction effects between the aggressive arousal and alcohol use complicate any explanatory model. (In this connection it could also be asked how much alcohol-related domestic violence is due to reactions by one spouse to excessive alcohol use by the other spouse.)



(iv) Escalation of aggression in alcohol use situations

The situation that seems to have been on the mind of many a student of aggressive behavior is a stereotyped version of a barroom brawl in a working-class tavern. To this picture belongs a rapid sequence of events from an exchange of angry words to escalating retaliation, a fight and as a possible outcome a homicide. Probably this widespread conception is influenced by westerns on television and on the screen, where saloon brawls seem to be a necessary ingredient. The etiological role of alcohol is often not made clear in these staged versions. It may be implicit, but it seems that situational factors (a gathering of men in their best fighting years) and cultural factors (the western frontier ethos and associated behavior norms) are given more prominence. The existence of expressions such as "barroom brawls" and "drunken brawls" in common parlance also indicates that, whatever the cause, there seems to be a higher risk of violence in these surroundings.

The typicality of this stereotyped situation has not been well established and the inevitability of the escalating process from an exchange of words to violence has not been documented. Wolfgang (1958), in fact, showed that the modal place of homicide was the home. Fifty-one per cent of the criminal homicides in Philadelphia were committed in somebody's home. Pokorny (1965) found that 42% of the criminal homicides in Houston were committed in the home of either the victim or offender and Voss and Hepburn




(1968) in Chicago found that 37.6 per cent of the male victims and 61.5 per cent of the females were slain in the home. Mayfield (1972) found in his North Carolina sample of homicides and assaults that 46 per cent of these crimes were committed in the home. Pittman and Handy (1964) note that 11.2% of their sample of criminal aggravated assaults in St. Louis took place in a tavern and in Pokorny's (1965 ) study the percentage was 13.6. In the former study the offender and victim had been drinking together prior to the crime in a majority of cases in which alcohol was involved.

Mayfield (1972) notes that 35% of assaults in his study took place in a drinking situation. He points out the relatively high prevalence of sudden escalatory processes resulting in violence: "The assaults are typically sudden, impulsive acts - too frivolous of motivation to be convincingly labelled 'crimes of passion '. They are often a result of action and reaction between acquaintances who often do not have longstanding or deep grievance but rather a mutual state of intoxication and a readily available quick and lethal weapon." There may be large differences between cultures and jurisdictions in the escalatory pattern. West (1968) in describing 100 homicidal offenders in Manhattan stresses the difference with English patterns: "In the many instances of homicidal quarrels it was noteworthy how often incidents had flared up unexpectedly from trivial beginnings, sometimes from quite casual encounters between strangers in





bars. In these cases the fatal outcome was invariably due to one of the participants drawing a knife or a gun, a chain of events that is less common in England".

Whatever the relevance of barroom brawls in accounting for violent crime, it has been noted that an escalatory process is present in other settings also. Gibbons (1971-72) in emphasizing situational factors in crime causation notes the typicality of this process: "Those who do engage in murder often do so within situations of marital discord or tavern fights, in which a number of provocative moves and countermoves of interactional partners culminate in acts of homicide...". Pittman and Handy (1964)  found in their study of aggravated assaults in St. Louis that the offender and the victim had generally been in interaction with each other before the violent act. In 181 out of 241 cases (75%) verbal arguments preceded the aggression: "These quarrels may range from domestic incidents to tavern disputes over who wants to sit on which bar stool. On the surface the quarrels appear to have little rationality.". Other authors who have emphasized the frequency of the escalatory process include Aho (1967), Bard and Zacker (1974), Aromaa (1974), Hopwood and Milner (1940), and Washburne (1961), who provides anthropological data from several primitive cultures.

Escalation has not been studied in any detail by psychologists. In their experiments they have generally been content with studying at the most the initial cycle of



the process. There are a few remarks by experimental psychologists that show an awareness of its explanatory value (e.g. Buss, 1963; Ryan, 1970; Epstein and Taylor, 1967). Shuntich and Taylor's (1972) study, in which intensities of shocks administered to the subject were gradually increased, has some bearing on escalation. Their results show a higher shock level administered to an alleged opponent over all the levels of shock which the subjects received. However, subjects in the control and placebo conditions adjusted their shock settings much more closely to the shocks given them by their "opponents".

The most detailed analysis of escalation has been undertaken by Shoham et al., (1974). The authors acknowledge that it is only a beginning of a study of situational aspects of violence. A violent act is seen as the end product of an escalating series of provocative acts, each response serving as a stimulus to the adversary. The role of the ambiguity of some acts in this series, especially the initial ones, is also built into an explanatory scheme. There is no mention of the possible effects of alcohol or other drugs on escalation into violence.

The authors emphasize the importance of the interpretation of the acts of the opponent. A remark can be interpreted in a number of ways e.g., as an aggressive remark, as a joke, etc. Depending on the interpretation a potentially aggressive interaction can stop soon after initiation. Epstein and Taylor, (1967) also point to



findings in their experimental studies which show that in "continuous aggressive competitive interaction, perception of the opponent's aggressive intent is a far more potent instigator to aggression than frustration in the form of defeat". (Mayfield, (1972), found that in 50% of the cases the victim had made an attack or a move which the offender interpreted as an impending attack immediately prior to the homicide or assault.) The role of alcohol as a possible facilitator in the escalation process has not been studied. The only systematically collected indication of the importance of an escalatory process in violent crimes in which alcohol is involved, can be had from information on victim precipitation. In these instances the escalatory process contains at least one cycle of interaction. Wolfgang (1967) found that the victim had precipitated the homicide in 26% of the cases in his Philadelphia sample. Alcohol use was significantly more often present in the homicide situation where the victim precipitated the act of homicide (in 74% of the victim-precipitated cases versus 60% of other homicides). The victim had been drinking in 69% of the cases of victim-precipitation and in 47% of the other cases. Voss and Hepburn (1968) found that 43.9 per cent of 164 criminal homicides in which alcohol was present were precipitated by the victim, whereas this was true for only 31.3 per cent of the 134 cases in which alcohol was not present. Virkkunen (1974) found that in criminal homicide cases in Helsinki, Finland, "aggressive behaviour and altercation" preceded the criminal act more



often in cases in which alcohol had been used. In these cases the aggression sequence had been started by the victims as often as by the person who finally became the offender. An aggressive act can be conceptualized as a frustrating stimulus to the opponent in most situations. Frustration again may lead to other reactions than aggression as Buss (1963) points out. Thus the victim of verbal aggression may retreat, try to make a joke, try to soothe the aggressor, etc. Implicit in many of these reactions is an attempt at a redefinition of the situation to the aggressor, other participants in the situation, and perhaps to the victim of initial aggression himself. Coping devices, such as redefinitions of the situation, are learned and to a large extent culturally determined. In cultures placing great emphasis on manliness, machismo, physical prowess, etc., the use of coping devices in the face of aggression without "loss of face" (see Goffman, 1967) is probably more limited than in other cultures. The more alternative coping devices provided by the culture in situations where aggression is displayed, be they in the form of retreats or redefinitions, the less is the risk of escalation into violence of initial aggressive acts (acts interpreted as aggressive). Due to psychological effects of alcohol it seems likely that coping devices which require an abstract conceptual command of the situation will have a smaller probability of occurring when the individual is intoxicated (see Tarter et al., 1971; and Kastl, 1969). Thus the number of coping mechanisms available probably decreases





during a state of intoxication. A systematic investigation of coping mechanisms in equivalent non-alcohol and alcohol settings would shed some light on the greater likelihood of violence under the influence of alcohol. The conceptual dimension of alcohol effects could easily be investigated by experimental methods comparing the subjects' interpretations of the behavior of other individuals in alcohol use situations with those in situations where alcohol is not used. Other more specific independent variables e.g., blood alcohol levels should also be investigated for their effects on this dimension.

The coping mechanisms more likely to be used under the influence of alcohol will be the ones determined by the immediate situation. Jellinek and McFarland (1940), as quoted by Kastl (1969), make the following generalization in summarizing experimental results on alcohol effects: "... after alcohol ingestion, associations are impoverished and follow a path of least resistance". The "path of least resistance" consists of behavior cues and stimuli which are present in the immediate situation whether these stimuli be internal or external. The statement by Jellinek and McFarland is confirmed by Kastl (1969) in his experimental measures of ideational association. Washburne (1956) suggests that a narrowing of the time dimension is "the most important factor associated with role-playing situations involving the use of alcohol". He also mentions his own observations which indicate that the mere presence of alcohol (via the



cultural definition and learned cue value, no doubt) can lead to a "decreased awareness concentrated upon the immediate situation". Washburne suggests that this probably is responsible for much of what is labelled "antisocial behavior" in connection with alcohol use. These actions of alcohol are one aspect and/or cause of the "here-and-now" character of behavior under the acute influence of alcohol and in the behavior of alcoholics. (The etiological role of decreased abstracting abilities in violence among alcoholics, will be discussed in a subsequent section.)

A well known, but not sufficiently documented, feature of behavior in alcohol use situations and under the influence of alcohol is the lability of affect and behavior. It is known to observers or participants of drinking occasions that in addition to aggressive outbursts there are displays of kissing, hugging and backslapping in these situations (see MacAndrew and Edgerton (1969) for a thorough discussion). As mentioned earlier the large variation in behavior exhibited in alcohol use situations probably partly explains the popularity of the disinhibition concept in explanations of drinking behavior. It is largely a formal model and thus no specification of the resulting behavior is needed, except that it is "disinhibited" in a descriptive sense. Thus, all these reactions to alcohol can be incorporated into the "model". Anecdotal references to the affective lability in alcohol use situations and among alcoholics abound in the



literature. Whittet (1973) mentions the instability of the intoxicated person; he vacillates between being a "belligerent bully" and a "besotted buffoon". Hopwood and Milner (1940) make the following impressionistic observation: "A drunken man is usually extremely unstable, whether he be a chronic or a "spree" drinker, and some slight and insignificant annoyance may produce such an exaggerated effect on the emotional tone that he may react with great violence and aggressiveness." Aho (1967), impressionistically and in passing, and Martocollis (1962) on the basis of observations in experimental situations, mention this fluctuation.\* (One word of caution, however. If predispositional factors are relevant in the explanation of the link between alcohol use and violent and other emotionally determined behavior, we have to assume that a significant amount of intraindividual stability exists.)

A decrease in the conceptual and abstracting abilities can be used to construct a model to explain the extremeness and unpredictability of affect and behavior under the influence of alcohol. Of more relevance for this purpose, however, is the experimental evidence showing that one of the consequences of alcohol intake is a lessened ability to act upon several cues at the same time, based upon a narrowing of the perceptual field (Medina, 1970; Moskowitz and DePry, 1968). The overall findings, however, are somewhat conflicting probably due to variations in the BACs and the measures of the dependent variable (Tarter et al., 1971).





Assuming that a greater number of cues are perceived in a sober state, we can deduce by statistical reasoning that a greater number of cues have to change for the interpretation of the situation (including the interpretation of the behavior of other people) to change, than in an intoxicated state. It is possible to show statistically that a combination of few elements in a universe is more randomly distributed than a combination of many. (This fact is the basis of sampling statistics.) The actions of a person can be interpreted by an intoxicated person in the same situation, in extreme, comparatively randomly determined ways, since the interpretation is determined by fewer events or cues in the situation and behavior by other individuals. Thus, for example, aggressive remarks can be interpreted as jokes and jokes as aggressive remarks to a larger extent than in a sober state. The interpretation of the actions or remarks of other individuals will be determined by chance to a much larger extent than in comparative sober situations. The lack of restraint typical of many drinking occasions and the mood fluctuations (which are more extreme than in comparable sober situations) are a consequence of this. The interaction between two or more individuals who are sober is probably much less fluctuating emotionally than the interaction when one and especially if both of them are intoxicated, although the "initial interaction" and the setting are the same. This could (and should) be studied empirically by experimental and observational means.



Pastore (1952), Russ (1963), and Epstein and Taylor (1967) have showed that aggression which is seen as arbitrary, as being the result of the whim of the aggressor, elicits more aggression than aggression which can be attributed to an acceptable cause or reason. Due to the narrowing of the perceptual field we can assume that the probability for two individuals to see overlapping cues as relevant in the situation will be less than in a sober situation (this is strictly statistical reasoning). Thus the one will more likely fail to see a justification for the other person's action. Consequently, the action of the other person will seem more arbitrary and will thus evoke more aggression, which again has a higher probability of seeming arbitrary and thus the probability of escalation into physical violence is successively increased over the comparable probabilities in a sober situation. In addition to the perception of cues, conceptual reasoning and abstracting ability are required in a justification process, in trying to "understand" the behavior of the other person, and these have been shown to deteriorate under the influence of alcohol (Tarter et al., 1971). Instead of separate explanations for the actions of alcohol on aggressive and affiliative behavior we have one model which is formal in character. It can thus incorporate different types of behavior. The disinhibition "model" has at least served the function of showing us that a formal model is needed to account for behavior changes in connection with alcohol use. Instead of a mechanistic model of unalterable

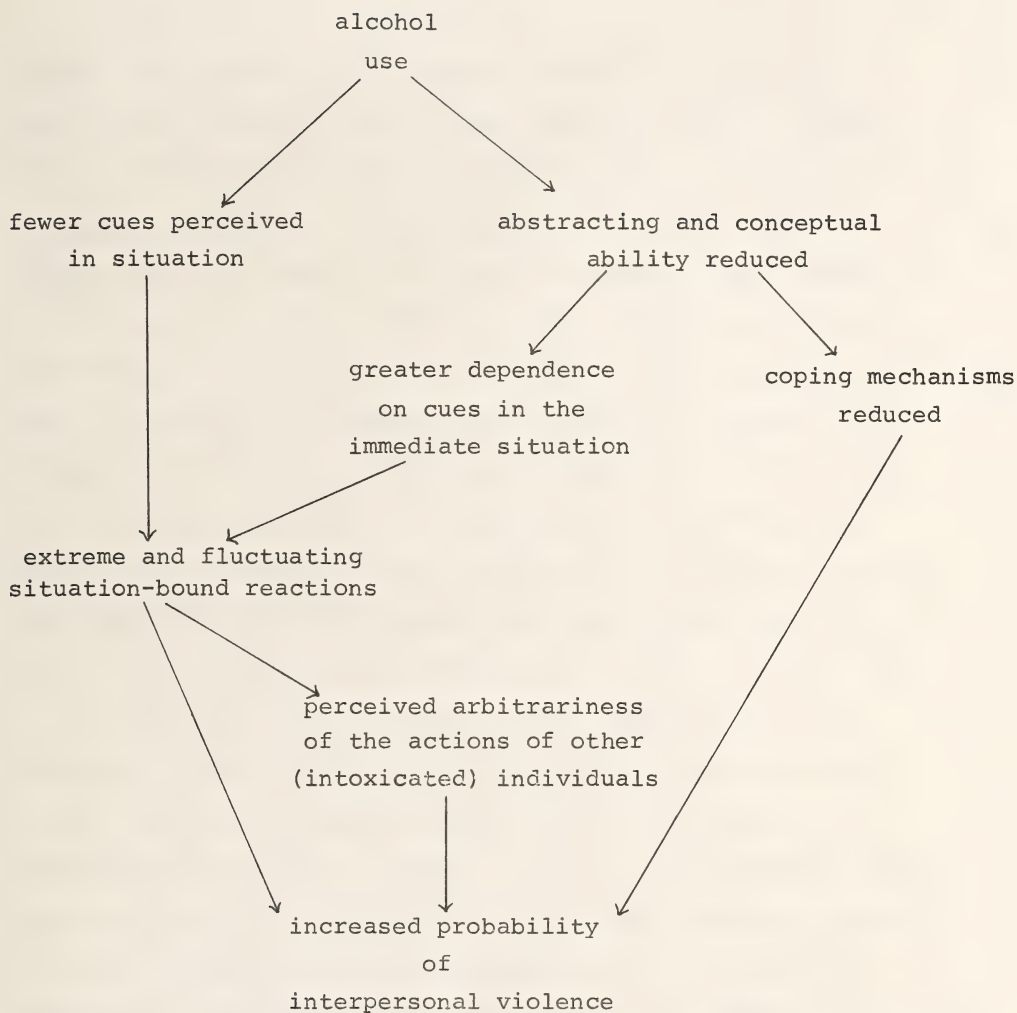


alcohol effects, however, we need models that account for the varying and often extreme effects of alcohol by explicating the concept of "social setting". The social setting as a causally relevant conditional or interactive factor is probably very often on closer inspection a set of interactions among individuals.

In summary, it can be said that the narrowing of the perceptual field with the consequent random determination by a smaller number of cues (and possibly a concomitant preponderance of "inner" cues, or drive states), experienced as significant in the orientation to the situation and the interpretation of the behavior of others, lead to a higher likelihood of violence in drinking situations. Another causative factor is the conceptual impoverishment and decline in abstracting ability under the influence of alcohol, which decrease the likelihood of use of coping devices which go outside the immediate situation, and thus cut down the probability of alternative acts. Many other factors are probably relevant to the escalation process, many of them of conditional cultural nature, such as definition of drinking situations as "time out" or risk-taking situations; other factors are more directly related to the pharmacological effects of alcohol, such as the paresthesia induced by alcohol (Hartocollis, 1962). (Paresthesia would be an intervening variable in this explanatory scheme.)

The following chart summarizes the above discussion:





Aromaa (1974) has hypothesized that individuals who are comparative strangers to each other more easily misinterpret each others' intentions, and "random behavior" thus results more easily. As Wolfgang (1958) and other investigators (e.g., Pokorny, 1965 ; Voss and Hepburn, 1968) have





pointed out, however, most violent crime is a result of aggression between people who know each other well. Interaction characteristics and escalation cycles of strangers can thus only explain a minor portion of violent crime. Whether the individuals know each other well or not, however, it is clear that cutting down the number of possible interpretations of a situation and the possible cues available in order to decrease the probability of ambiguity through "random" selection of a few cues, will decrease the likelihood of an escalation process in this probabilistic model.\* This is done in marihuana use situations by dim lights, reduced commotion and soft music (as an inescapable common set of cues ), (see e.g., Orcutt, 1972).

We have seen above that even where coping devices are available in the culture the skills in using the ones based on more conceptual complexity have been reduced by the psychological actions of alcohol. This is all the more reason for providing within the culture unambiguous and numerically few cues to guide the interpretation of the situation and consequently the reactions of individuals when alcohol is used. If the more or less random situational cues are predominant and there are not enough culturally defined unambiguous counteracting cues present in the situation, the interpretation of which is well established via socialization (e.g., norms), the probability of aggression will increase.



It seems probable that ritualistic drinking in numerous different societies, (as described in the anthropological literature by Washburne, 1961; MacAndrew, and Edgerton, 1969; Heath, 1958; Madsen and Madsen, 1969; and others), with strong sanctions for breaking norms, would help to contain personalistic and situational interpretations of the situation and the behavior of other individuals. Heath's (1958) study of the Camba in Bolivia can be used here to typify the pattern of ritualized drinking. The Camba drink a beverage of very high alcohol content in amounts leading to general intoxication and even stupor at drinking occasions which can last several days. Yet: "Aggression and sexual license are conspicuously absent". The answer to this puzzling pattern in the primitive societies may lie in the very ritualized sequence of drinking demanded in the culture.\* MacAndrew and Edgerton (1969) discuss several other examples. The fact that many primitive tribes have built safeguards against extreme behavior in drinking situations is probably due to a greater vulnerability to disruptive behavior of small primitive societies. Even when aggressive displays lead to fighting it is not uncommon that the escalation process itself is formalized (Washburne, 1961). This decreases the likelihood of randomness in the behavior cues as perceived by the opponent, and the probability of an uncontrolled escalation process.

Ritualization works in at least four ways to decrease the probability of violence in connection in alcohol use:



- 1). It leads to a reduction in the number of indeterminate cues in the situation and in the behavior of other individuals, which could lead to any number of interpretations by other participants.
- 2). It provides a cognitive interpretative framework of a few central cues via a cultural "meaning" of behavior which minimizes interpretations of behavior which would mainly depend on the situational cues and individual motivational states.
- 3). It increases the probability of "consensus" on cues seen as relevant, merely by cutting down the number of cues available in the situation.
- 4). It provides external cues of adequate strength to overcome a possible preponderance of inner cues and drive states. If there is a greater likelihood of mood fluctuations when the "controlling" influence of external cues is cut down, this will be reflected in the behavior.\*

The "risk-taking" character of behavior in alcohol use situations and under the influence of alcohol, which is partly determined, no doubt, by the cultural definition of alcohol use situations as "time out" (MacAndrew and Edgerton, 1969), can probably also be explained by the narrowing of the perceptual field, and the more randomly determined behavior.

Tinklenberg (1973) in his discussion of the connection between alcohol and violence has suggested that the model of assaultive behavior put forth by Melges and Harris (1970) applies: "Individuals with distorted temporal perspectives involving excessive focus on present here-and-now stimuli are prone to violence," (Tinklenberg,





1973). This condition would thus be due to a predispositional dysfunction in the perceptual and/or cognitive faculties of certain individuals. The reasoning above has shown that the same causal factors may be at play (intra-individually and more generally) where alcohol is used, irrespectively of any propensity of some individuals (although interaction effects naturally may produce some high-risk subpopulations in alcohol use situations).

There is much to be gained from a dynamic situational and interactional approach to the problem of the role of alcohol in the etiology of violent behavior, as opposed to a mechanistic quasi-explanatory (often merely descriptive) use of the "disinhibition" concept, which does not take situational factors into account. (The analysis of the widely used disinhibition concept and the criticism of its vague use does not imply that the concept has not been used legitimately to refer to specific physiological (Kalant, 1961; Moyer, 1971) and psychological (e.g., Rada, 1975) models).

It is probable that the excess of prior alcohol use by both the victim and the offender noted in Part I can partly be accounted for by the escalation facilitated by the subjectively perceived arbitrariness and the objectively definable randomness of the opponent's reactions. The model suggested above explains a number of different types of "disinhibited" behavior and fluctuations between these in alcohol use situations and may explain certain aspects of the escalatory process leading to violence.



It should, once again, be emphasized that interaction processes between individuals in a drinking situation must be studied. Labelling the whole array of possible causative variables of a social nature and the group processes as "social setting" without further inquiry, will leave much of aggression and violent crime in alcohol use situations essentially unexplained. The model presented here can be seen as an illustration of the task ahead, and an attempt at arriving at parsimony in a widely scattered field.

b. Predispositional variables

Most of the factors studied in connection with violent behavior in general are rather permanent variables introduced to explain violent tendencies in certain individuals. To this category belong most biological variables that have been put forth, such as general innate aggressive instincts of man as a species, temporal lobe dysfunctions, etc. Some social factors of etiological significance are also rather stable over time. This is true for the subculture variables, such as the "subculture of violence" (Wolfgang and Ferracuti, 1967). The existence of stable characteristics in the etiology of violent crime is well established by the mere fact of high recidivism rates among violent offenders (Williams, 1969; Greenland, 1971 and 1973; Walker et al., 1970; Bach-y-Rita et al., 1971). Predispositional factors such as temporal lobe dysfunction, or violent subcultures in their main effects on aggressive behavior are not of interest to us here. They



only concern us insofar as they interact with alcohol use over and above the main effects of both variables, i.e., as conditional or interactive variables.

Predispositional variables in our terminology are variables which show interindividual variation in a stable manner over time, with only relatively small intraindividual variation. (Values on most variables probably show both types of variation but relatively valid distinctions are still possible.) Accounting by models using predispositional variables could be called "accounting by subpopulations". Before an accounting of the association between alcohol use and violent crime via a model using predisposing variables (and also the models using conditional situational variables discussed in a previous section) can be started, it must be shown that the null hypothesis is not true in the subpopulation labelled by the relevant conditional variable (e.g., alcoholics or individuals with temporal lobe dysfunctions). It has to be shown, in other words, that the probability of both using alcohol and displaying aggressive behavior at one time by chance is not sufficiently greater in these subpopulations. If there is a greater probability of alcohol use, it also has to be shown that the alcohol use does not through its main effects explain the epidemiological association. The question thus is: is there a larger increase in the probability of violent behavior when alcohol is used by individuals with any one or more of the potential predisposing characteristics,



than when other individuals without the same characteristics use alcohol. The considerations of a chance association (null hypothesis) and main effects of higher alcohol use are not relevant in properly carried out experimental work on reactions to alcohol use of e.g., alcoholics (using non-alcoholics as controls), but these problems are the curse of epidemiological and statistical data.

For the accounting aspect of the connection between alcohol use and crimes of violence it is also important to keep in mind the prevalence of the predisposing condition. It is evident, for example, that even if there were an interaction effect between XYY chromosomal abnormality and acute alcohol effects in aggressive behavior, this could only explain a minor part of the epidemiological relationships between alcohol use and violent crime or alcohol use and general aggressive behavior, because the prevalence of XYY chromosomal abnormality is so small (in the order of 1:700 in new born males, see Ratcliffe et al., 1970). It should be recognized however, that many predispositional variables of a biological nature may in fact be continuously distributed in the general population, although the extreme cases turn up in clinical samples. This is suggested by Moyer (1971) in his discussion on temporal lobe dysfunctions: "...individuals manifesting inter-ictal or sub-ictal dyscontrol syndromes are on a continuum which varies from homicidal behavior to occasional "normal" irritability".





Interindividually varying but intraindividually (situationally) stable characteristics can be relevant as conjunctive variables, although they cannot covary with occurrence of or amount of alcohol use. If there is a selection of individuals to alcohol use situations, possibly due to cultural or subcultural variables, and the selective criteria are positively correlated with aggressive tendencies regardless of alcohol use, this would explain the epidemiological association by using a conjunctive variable (aggressive tendencies). However, data do not exist to lend significant support to the validity of any model of this type and it will not be discussed in any length in this section. Predisposing factors cannot be intervening variables, caused by acute alcohol use via its main effect, since intervening variables must vary with the independent variable, in this case alcohol use, which means that intervening variables must here be of the situational type. The possibility still exists that some (intervening) effects of alcohol use would interact with predisposing factors so that e.g., sleep deprivation effects would be more extreme in individuals with temporal lobe dysfunction and lead to a greater probability of violence in this way. It would, however, take us too far into speculative detours to consider the possibility of more complicated models for which there is as yet little or no empirical data available. Predispositional intervening variables affected by alcoholic prolonged and excessive drinking will be considered in a special section below which deals with the explanatory models accounting



for the relationship between alcoholism and violent crime. Thus, in this section I will only discuss the role of predispositions mainly as conditional or interactive and briefly as common cause factors. Sometimes it is not made clear in the literature which of these two types of models are indicated or even whether a model with the predisposition as an intervening or dependent variable and with alcoholic drinking as independent variable is invoked.

(i) Conditional or interactive variables

Few experiments have been carried out studying the effects of alcohol on aggression in systematically selected samples of individuals whose violence-proneness has been established epidemiologically or clinically. However, experimental psychologists, even when working under the direct cause paradigm, have been aware of the limitations of their methodological assumptions. Bennett et. al., (1969) among others, acknowledge the relevance of the characteristics of the subject population.

There are some mentions in the epidemiologically oriented literature of interaction effects between alcoholism and acute alcohol use in producing a greater probability of violent behavior than what could be expected by either variable by itself or conjointly (Hopwood and Milner, 1940; Hoff and Kryspin-Exner, 1962; Ando and Hasegawa, 1969; Bennett, 1967), but they are not substantiated with systematic empirical data. Since we do not have the information needed to establish a



null hypothesis, it is impossible to tell whether these observations are due to the main effects of "alcoholism" or main effects of acute alcohol use.

Alcoholism of the subjects is the predispositional characteristic most often included in experimental studies which use alcohol intake as the independent variable and aggression, or a potential intervening variable such as aggressive mood changes, as the dependent variable. The relevant experimental studies have generally been designed to explain the excessive drinking of the subjects, but some of them measure variables which seem relevant to an explanation of aggressive behavior. This is due to either semantical or empirical links between the variables measured and aggression. To the extent that the links are empirical, these variables can be seen as intervening variables between alcohol use and aggression (at least in the specific subpopulations).

The labels "alcoholics" or "heavy drinkers" can most fruitfully be looked upon as a cluster of variables, some physiological or psychological and some social and subcultural. Some of the variables in this cluster may interact with acute alcohol use and the situations in which alcohol is used, to produce a higher than expected probability of aggressiveness, while others may not. I will not try to extract these in this discussion due to lack of empirical data, but instead use the general labels of "alcoholics" or "alcoholism".

In a methodologically sound study Mayfield and Allen (1967) administered alcohol intravenously to alcoholic patients and a group of controls. The dependent variable in their study was





affect as measured on the Clyde Mood Scale. The dose was rather low, the equivalent of 5.2 cl of absolute alcohol (approximately three bottles of beer). They concluded that alcohol altered several affects among which aggression was least affected. Both the preinfusion and postinfusion scores for aggressiveness were virtually identical in the three groups of subjects. Contradicting this negative finding there is evidence from other experiments showing that alcohol effects are markedly different in alcoholics as compared to non-alcoholics, as van der Spuy (1972) points out. In reviewing the empirical literature on alcohol's effect on the mood of alcoholics he concludes: "The alcoholic's emotional state appears to benefit considerably less from alcohol than the emotional state of the non-alcoholic." To the extent that this is the case, it could partly explain any excess clustering of violence to alcoholics. As pointed out above, however, some of the experiments on the effect of drinking on alcoholics are not comparable to experiments on non-alcoholics because the drinking is much more prolonged (for reasons of representativeness). The indication is that the increase in depression and anxiety (Mendelson et al., 1964; Nathan et al., 1970), and hostility (Nathan et al., 1970), is reported after two to four days of drinking. Sleep deprivation and other (stress) factors may be at work by that time, and this could be true also for non-alcoholics in an equivalent research setting. The



amounts consumed may not be comparable either, and consequently not the blood alcohol levels. These factors could explain some of the discrepancy between Mayfield and Allen's (1972) findings and the findings from most other experiments with alcoholics, since Mayfield and Allen used a comparatively short experiment and relatively small amounts of alcohol. It could, however, be said that typical alcoholic drinking patterns increase the likelihood of aggressive reactions, but these drinking patterns would have to be considered a conjunctive independent factor and not a predispositional feature of alcoholics which would interact with alcohol use. One word of caution is in place here: there are great differences between alcoholics both situationally in their reactions to alcohol and as to more stable predisposing traits and characteristics (see e.g., Vannicelli, 1972; Partington and Johnson, 1969) and this discussion which treats alcoholics as one group should not hide this fact.

There is evidence showing that alcoholism, or, more specifically, prolonged excessive use of alcohol, can give rise to stable interindividually varying characteristics, which increase the probability of violence through their main effects. Some of these characteristics will probably interact with acute alcohol use to produce an increased probability of interpersonal violence. These characteristics in their main effects on this probability will be discussed in the last section of this chapter.



Predispositional variables of a biological nature adduced as independent variables in the general explanation of violent behavior include: testosterone production (Moyer, 1971; Persky et al., 1971; Eleftheriou and Scott, 1971; Williams, 1969; Hamburg, 1971) psychomotor epilepsy and temporal lobe dysfunction with abnormal EEG patterns as symptoms (Moyer, 1971; Stafford-Clark and Taylor, 1949; Mundy-Castle, 1957), history of head injury (Bach-y-Rita, 1971; Hopwood and Milner, 1940), history of convulsions (Bach-y-Rita, 1971), XYY chromosomal abnormalities (e.g., Baker et al., 1970). There is much less relevant data on possible biological predisposing characteristics of causal relevance to the explanation of the relationship between alcohol use and violent behavior.

Pathological intoxication is the clearest indication of an interaction mechanism of alcohol and some probably physiological predisposing variables. No representative epidemiological data exist on the proportion of cases of pathological intoxication in violent crimes. Reports of the connection with unknown representativeness of the universe of violent crime include Julius and Bohacek's (1954) study in Yugoslavia. In ten out of nineteen cases of murder pathological intoxication was implicated (the sampling procedure is not known). The authors claim that the pathological reaction to alcohol was proven by test. Zakowska-Dabrowska and Strzyzewski (1969) in Poland studied a sample of 63 men who had committed crimes (of an unspecified nature) while under the influence of alcohol.



They found that EEGs were abnormal prior to ingestion of alcohol in the experimental situation in eleven of the 52 cases of "simple intoxication"; after ingestion of alcohol the EEGs of an additional 23 subjects were abnormal. The EEGs were normal both before and after alcohol ingestion in the experimental situation in all the six cases where pathological intoxication had occurred at the time of the crime. Cuthbert (1970) found that in his sample of 70 murderers alcohol activated or enhanced EEG spiking in six out of seven offenders with severe temporal lobe dysfunction. Marinacci (1963) found evidence in a large sample of violent individuals that EEG patterns changed towards dysrhythmia after ingestion of alcohol and in some cases violent behavior followed. Other authors reflect the same view (Skelton, 1970; Greenblatt et al., 1944; Thompson, 1956). Bach -y-Rita et al., (1970), however, failed to replicate Marinacci's (1963) findings of epileptic discharges after alcohol ingestion in subjects who had displayed signs of pathological intoxication in the etiology of their repetitive aggressive behavior. Whatever the physiological mechanism, it is clear from the very small ingested amounts of alcohol and the dramatic displays of aggressive behavior that an interaction mechanism is at work. The behavioral effects of small amounts of alcohol over the general population and the often attested to timid behavior of the individuals in a non-alcohol state show that the main effects cannot explain the phenomenon.





Moreover, the repetitiveness of the pattern of small amounts of alcohol and extremely violent behavior show the existence of interindividual differences in reactions to alcohol, and thus the applicability of interactive or conditional models. The pattern is probably not entirely determined by endogenous factors, however, as is also suggested by Bach-y-Rita et al., (1971), who noted stress as a conditional situational factor in their sample of 130 patients: "As stress would build up, alcohol would frequently play a greater role in the patients' general daily routine: 72 reported that they had used or abused alcohol prior to their episodes."

Other claims of subpopulations with predisposing characteristics released by alcohol use that have been made but not substantiated by empirical research include "latent schizophrenics" (Baker, 1959), individuals who are "mentally incompetent" (Pionkowski, 1965), individuals with head injury (Hopwood and Milner, 1940). Another possible predispositional factor (which has been dealt with in some detail in a previous section) is sleep deprivation independent of alcohol use. Fasting will, in connection with alcohol use, cause hypoglycemia which again increases the likelihood of aggressive behavior (Moyer, 1971). Variables, which sometimes are seen as causing both a greater probability of alcoholism (or acute alcohol use) and violent behavior, but often not distinguished in the discussion from their distinct and possible role as predisposing interactional factors in



connection with alcohol use, include personality disorders, emotional instability, "aggressive types", etc. (These will be discussed in some detail in the next section.) The overlap of these with other labels and subpopulations discussed above is impossible to ascertain at the present time.

The experiment by Hetherington and Wray (1964) discussed previously showed that a high need for social approval combined with a high aggression need led to an increase in aggressive reactions after ingestion of alcohol, whereas this was not the case in subjects who did not have both of these attributes. The extent to which these attributes also vary intraindividually over different situations is not known, but such a variation seems likely. Similar findings were made in a study by Roebuck and Johnson (1962). They found that their sample of 40 Negro offenders who had a pattern of simultaneous "drunk and assault" charges were more often reared in homes with a rigid fundamentalist background than a comparison group of 360 other Negro offenders with a much more varied arrest pattern. The authors suggest that the rigid socialization led to a pattern where hostility could be manifested only after alcohol use.

Many predominantly social or cultural variables have been mentioned in general explanations of violent behavior or as subcultures showing higher prevalences of violent behavior (with or without alcohol involvement). Accounts of drinking occasions in some cultures seem to indicate that these are



characterized by anomie, normlessness. We have seen in the section on escalatory processes, however, that ritualized behavior is not uncommon even on occasions where large amounts of alcohol are consumed.

~~No doubt, societies, cultures and subcultures differ as to their predisposing conditions for violence. Whether~~ this is true also for their predispositional tendencies towards violence in connection with alcohol use, over and above the main effect of the cultural factors and of alcohol use itself, is another question. The importance of conditional, probably culturally determined, variables in the connection between alcohol use and aggression has been pointed out by a number of authors in the anthropological literature (MacAndrew and Edgerton, 1969; Washburne, 1956; Washburne, 1961; Child, et al., 1965a). Child et al., note that: "Boisterousness and a combination of exaggerated sociability and hostility are typical forms of behavior in our society for someone who has consumed a large amount of alcohol. Yet in some societies these forms are not particularly conspicuous."\*

One possible way in which cultural factors could produce a conditional or interactive relationship between alcohol use situations and violent behavior is through a different set of norms for alcohol use situations from those applying to non-alcohol situations. This has been suggested through the concept of "time out" in connection with alcohol use (MacAndrew and Edgerton, 1969), and has been documented in accounts of





festivals etc. (e.g., Listiak, 1974). Due to the methodological nature of the studies, it has not been possible to differentiate between the normative effects as opposed to the alcohol effects. Alcohol use situations could be defined by the culture e.g., as "risk-taking" situations testing the limits of situational opportunities, and thus there would be a main effect of the cultural definition, although interaction effects are probable. Whatever the reason, allocation of responsibility is lighter in the case of aggressiveness under the influence of alcohol in many societies, which sets the stage in the culture or subculture for more license, e.g., less severe normative sanctions, and leads to the association under study. It is probable that predisposing cultural norms exist which apply to certain subpopulations and/or are sustained by certain subcultures. It could well be that the differences found by Kalin et al., (1972) and Wilsnack (1974) in aggressive power concerns between the sexes in drinking situations are determined by cultural definitions of drinking situations. (A model which to some extent takes this into account was suggested earlier.) Bruun (1962) has shown that personal norms applying to drinking situations tend to correlate with actual drinking behavior, and if these norms in some cultures tend toward permissiveness or perhaps positive sanctioning of aggressive behavior, an association between alcohol use and aggression will arise within the culture.



Cultural factors pervade drinking occasions and enter causal models in many ways beside their mainly conjunctive causal significance in providing typical settings for drinking, in which situational and alcohol use variables determine the outcome. One such additional way is provided by an elaboration of results arrived at by Epstein and Taylor (1967) in their psychological experiment on determinants of aggressive behavior. They found that aggression that is considered legitimate will not lead to aggression or other forms of negative reactions as often as power and aggression which are not regarded as legitimate. (This fact has also been discussed in sociological treatises of social power.) In typical Western drinking situations, at least, there probably does not exist as much basis of legitimate justification of aggression as in non-alcohol situations. This is so because drinking is done among equals (in most relevant statuses) through social selection processes and because participation in drinking situations is often symbolically a sign of relinquishing status differences for the occasion. Thus drinking occasions are atypical in this respect since most interactional situations are structured as to status. Epstein and Taylor (1967) found in their study that "...'might makes right', so that when a person in a position of power attempts to act aggressively it is considered to be less determined by aggressive motivation per se than when a person with lesser power exhibits the same intent". **A legitimate transfer of power** from other situations into the drinking situation which is defined



culturally in a quite different way from e.g., a work situation, is probably possible only to a limited degree. If drinking situations (sometimes peripherally) include strangers, a transfer of structuring from other situations is impossible.

For purposes of accounting for the relationship between alcohol use and violent crime through conditional or interactive variables the prevalence of the predisposing condition is crucial. Few estimates of prevalence are available for these states, and the threshold value of many predisposing states (e.g., brain dysfunction) is unknown, so that the size of the population at risk is not known.

(ii) Predispositional common cause explanations

The common cause explanations that have been suggested in the literature refer mainly to interindividually variable, but intraindividually rather stable characteristics of individuals, and they mostly refer to the association between alcoholism and (violent) crime. (These will be discussed in the next section). Individual characteristics have, however, also been adduced in explanations of acute alcohol use and crime: "The man who gets drunk may commit crime, but this is not because drunkenness led to crime: personality disorder or multi-determined social breakdown may be the common factor leading both to crime and to drunkenness " (Edwards et al., 1971). Predispositional factors which have been adduced as common cause factors in alcoholism and violent crime are developmental or constitutional in nature: childhood experiences, affective disorders,



organic brain disorders, psychopathic personality, emotional instability, "aggressive types", etc. A third possibility is the existence in the cultural matrix of social selection processes which more or less force a person who has proclivities either towards violence or excessive alcohol use into a subculture or drinking situations where heavy drinking and/or violent behavior are culturally expected, such as in a "subculture of violence" (Wolfgang, 1967). Cultural selection and subcultural expectations would thus be the determining factor in explaining the association and not alcohol use (or alcoholism).

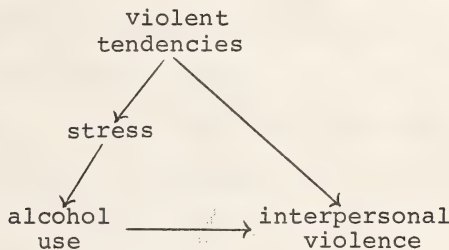
Generally the common cause variables adduced are the same as those found in the literature on violence proneness and alcoholism. The increased probability of acute use is not very often distinguished from "alcoholism" or "heavy drinking" as an independent variable. For this reason I will postpone the discussion to the next section and advise the reader that wherever I talk of "alcoholism" as a dependent variable in a common cause model it could also be read as "increased probability of acute alcohol use".

Before discussing models accounting for a statistical association between alcoholism and violent behavior, however, I shall present a model suggested by Nicol et al., (1973), which is one of the few sufficiently specific to warrant a discussion. A similar model has been suggested by Bæch-y-Rita et al. (1970 and 1971). The suggested model combines predisposing and situational variables with a common cause framework. Nicol





et al., see drinking as a frequent response to stress in a subsample of violent prisoners which they studied. The probability of violence in individuals with violent tendencies is further enhanced by the pharmacological effects of "alcohol taken under these conditions" the authors suggest. Stress is also more likely to occur in these individuals, since they have difficulties in "initiating and maintaining satisfactory interpersonal relationships". The model may be schematically illustrated with the arrow diagram below. (The possible conditional or interactive relationship between stress and alcohol use in producing interpersonal violence suggested by the phrase "alcohol taken under these conditions" has not been taken into account. There is also the possibility of a causal link between stress and interpersonal violence, but it is not explicitly suggested by Nicol et al.).





B. EXPLANATION OF THE POSITIVE RELATIONSHIP BETWEEN  
ALCOHOLISM AND VIOLENT CRIME

In this section I will use the label of "alcoholism" or "alcoholics" and still in the general discussion try to keep away from the possible causal relevance of labeling individuals as alcoholics and other societal reactions connected with the labeling. If labeling and other reactive processes seem to have explanatory value in accounting for the connection between alcohol use of the acute or the chronic type, such as perhaps in the rise of a criminal (or risk-taking) subculture, I will specifically mention this in the discussion. In studies of clinical alcoholic samples and their involvement in violent crime or experimental studies using clinical samples of alcoholics the labeling aspect will probably have more explanatory value than in prison samples, which often use drinking patterns for their definition of "problem drinkers" or "alcoholics" in prison. In prison studies which use clinical experiences and societal reactions for their definition of "alcoholics" the labeling aspect will have more explanatory value.

Prolonged excessive alcohol users would be expected to have a higher probability of being under the influence of alcohol or having used alcohol immediately prior to any act. This means that the value of the null hypothesis, in testing whether the relationship between alcoholism and violent crime (or aggressive behavior in general) is higher than expected by chance, would have to be set higher in this subpopulation than in the general population. This is so because of the effects of acute alcohol



use on the increased probability of aggression. If the null hypothesis thus arrived at were rejected it would mean that prolonged excessive drinking, its conjunctive features and causal consequences (intervening variables), or common cause variables, or any combination of these would have to be used to account for the association. Acute alcohol use could also, due to the nature of the drinking patterns in this population, explain away part of any excess involvement in violent crime of this population. As we have seen in the section on the nature of the independent variable, different variables in epidemiological research and statistics hidden under "alcohol use" or equivalent labels, have been considered of potential explanatory value in the connection between alcohol and violence. It is possible that alcoholic drinking patterns include more of high risk features, e.g., drinking of larger amounts or beverages of high congener content (in some subpopulations of excessive drinkers). In addition to the higher probability of violence due to acute alcohol effects, there are selective factors in the epidemiological studies available in what I have called the nature of the dependent variable which can add to the overrepresentation of this type of alcohol users among violent crime offenders (the only epidemiological indicator of violent behavior available). Firstly, there is the greater risk of being apprehended by the police due to the acute effects of alcohol. Secondly, over and above this, disproportionately many alcoholic offenders are well known to the police compared to non-alcoholic offenders, which leads to a further increase in the risk of apprehension. Due to





their greater risk of alcohol use, all the possible biasing factors discussed in the section on the nature of the dependent variable are relevant in any study measuring the prevalence of alcoholics in an offender population. It also seems that alcoholics have a relatively high risk of recidivism (Gibbens and Silberman, 1970), and thus perhaps a higher probability of having longer sentences which would increase their share in all crime categories in prison studies.

Although selective factors in apprehension and a greater risk of acute alcohol effects probably can explain away part of a higher-than-chance risk of violent crime in alcoholic individuals, there are a number of conjunctive features of alcoholic drinking and consequences of intake of large amounts of alcohol over long time periods (intervening variables) which seem to have explanatory value. There are also certain variables of a developmental or otherwise predisposing type which have been adduced in the explanations as common cause variables and have thus been used to explain away the seeming causal association.

Prolonged excessive use of alcohol in its role as a conditional or interactive factor in causing violent behavior in connection with acute alcohol use has been discussed in the preceding section.

#### 1. Direct evidence of main effects of alcoholism

I will start with the evidence for a main effect of alcoholism.\* Here we assume that there is a higher probability



of individuals who drink excessively to act aggressively even in non-alcohol situations or while not under the influence of alcohol than there is for non-alcoholics in equivalent situations. Evidence for a main effect is hard to come by. Jellinek (1952) mentions "marked aggressive behavior" as typical of alcoholics in the "crucial phase". There are mentions in the literature of the general irritability, aggressiveness and feelings of hostility of alcoholics. Antons (1970) and Hassall and Foulds (1968) have reviewed a few of these suggestions. The latter authors replicated the findings of the two studies which they reviewed, and showed that a sample of young male alcoholics displayed more hostility than a matched control group of male hospital patients, in a projective test with items from the MMPI. On the other hand, Antons (1970) in his study, did not find that alcoholic subjects were more aggressive than other "Kurhaus" patients on a number of measures including a rating by treatment personnel at the institution. Mayfield and Allen (1967) in their experiment with alcoholics, severely depressed patients, and a control group of non-professional employees of a hospital did not find any differences in aggressiveness on the Clyde Mood Scale in the pre-alcohol condition of their experiment. (The uniform "Kurhaus" and experimental settings may have eliminated conjunctive causal factors and differences due to conditional and interactive factors present in more natural settings.)



## 2. Intervening variables

Despite the seemingly contradictory findings of a main effect of alcoholism on aggressiveness, there are a number of effects of prolonged excessive drinking which do seem to increase the likelihood of aggressive behavior in alcoholics as compared to non-alcoholics. The factors of most immediate value in explanations based on the main effect of prolonged excessive alcohol use are the intervening variables of brain damage and especially temporal lobe dysfunction, and secondly the formation of alcoholic subcultures. The alcoholic subcultures will be discussed later in a subsection on common cause variables, since societal reactions can be seen as a major factor in establishing an association of alcohol use and violence in these.

The prevalence of epileptic brain dysfunctions caused by long-term use of alcohol in the offender population in crimes of violence has not been established, although it is generally recognized that epileptiform changes occur after prolonged excessive use of alcohol (Giove, 1964; Della Rovere and Falli, 1965; Bacher et al., 1960; Bonetti, 1962). Giove (1964) estimates that epileptic crises occur in two per cent of alcoholics after about ten years of excessive drinking. He suggests that these attacks may be caused by the acute drinking episodes due to the sudden interruption of the depressive effects of alcohol. (This would show the interaction of this alcoholic condition with acute alcohol use.) He also mentions that (and this is more relevant in this context) cerebral lesions or atrophies caused by excessive use of alcohol may cause epileptic crises. Della Rovere and Falli (1965) also attribute



part of the clinical cases of alcoholic epilepsy to irreversible change of the nervous tissue. The etiological significance of excessive alcohol use in the development of epilepsy at a comparatively late age, has also been confirmed by Bacher et al., (1960) and by Bonetti (1962) in an extensive review of the literature. Sundby (1967) suggests brain trauma as a neurological complication of excessive alcohol use responsible for epilepsy. He also found that the mortality from epilepsy was seven to tenfold for alcoholics as compared to the general population. In Wilkinson et al.'s (1971) study, 8.2 percent of the alcoholics in a large clinical sample (sample size 825) were diagnosed as having epilepsy. There is disagreement on the probability and reversibility of brain damage in alcoholic populations (e.g. Bennett, 1967; Henry, 1970). Whether it is reversible or not, however, this condition has potential explanatory value. Accepting that alcoholics have a greater probability of temporal lobe dysfunctions and of this condition leading to an increased probability of violent behavior, we could conclude that prolonged excessive drinking could explain part of any excessive violence in alcoholics even outside of alcohol use situations. In accounting for the higher prevalence of violent crime among alcoholics, however, a prevalence rate of two per cent among alcoholics (Giove, 1964) probably is not sufficient to explain much, whereas Wilkinson et al.'s (1971) finding of 8.2 percent naturally is of higher explanatory significance. Also of relevance are Wilkinson et al.'s findings of 7.6 per cent of clinical





alcoholics having a chronic brain syndrome and 6.3 per cent suffering from acute confusional states. (There is overlap in these percentages.) The predispositional relevance of epileptoid brain dysfunction in acute alcohol use has been dealt with in an earlier section.

One less chronic intervening factor in a possible explanatory model of increased probability of violence in alcoholics is hypoglycemia. The hypoglycemia-inducing property of alcohol has been known for at least three decades (Herman et al., 1970). There is also general agreement that alcohol does not produce hypoglycemia in individuals who have not been fasting or are not undernourished, ( e. g. Moynihan, 1965). The estimates of periods of fasting needed before normal subjects develop hypoglycemia range from 42 hours (Field and Williams, 1962) to 72 hours (Freinkel, et al., 1962) or longer (see Moynihan, 1965). (In volume III of this work, Hillman (1974) has reviewed the existing literature on the nutritional habits of alcoholics.) Vartia et al., (1960) in briefly reviewing the literature note that low blood sugar values are common in alcoholics even when they have not been drinking and suggest a metabolic disturbance in the carbohydrate metabolism. Hypoglycemia on its part can cause aggressive behavior (Pawar, 1972; Moyer, 1971). If more or less permanent metabolic changes have occurred in alcoholics this would again mean that prolonged excessive drinking would have a main effect on aggressive behavior independent of acute



alcoholic drinking episodes through this metabolic disturbance.\*

There does not seem to be any information on the prevalence of hypoglycemia among alcoholics, although Herman et al., (1970) point out its rarity. Lacking this information it is difficult to arrive at a population at risk, and thus to make any estimates of the relevance of hypoglycemia and malnutrition as intervening or conjunctive variables in accounting for violent behavior in connection with alcohol use and alcoholism. In as far as hypoglycemic conditions occur comparatively frequently, it remains a task for epidemiological cross-cultural research to chart the drinking patterns and relevant conjunctive patterns of nutrition in order to explain different risks of aggressive behavior in alcohol use situations and thus explain differences in prevalences of violent behavior connected with alcohol. Variables of central concern should be amounts consumed at drinking occasions, the length of the occasions and eating patterns in connection with the use of alcohol. Possible interaction effects of hypoglycemia with acute alcohol effects in producing aggressive behavior do not seem to be discussed in the literature.

A further conjunctive feature of alcoholic drinking (or a definitional feature, if drinking patterns are included in the definition of alcoholism; for our analysis the difference is non-consequential), is the extension of drinking over lengthy periods of time, which induces the



intervening variable of REM-sleep deprivation. This variable again can, via its main effect (and possible interactions with alcohol use), lead to near psychotic reactions and violence. It has been suggested that the effect of sleep deprivation could be heightened in combination with pathological phenomena (Oswald, 1962 ; Gove, 1969-70). The mental and physical health status of the population at risk in long drinking bouts is comparatively low. The effects of sleep deprivation may be profound in this population, perhaps of the same magnitude as in the experiments on subjects with histories of mental problems. These have shown extreme psychological effects.

To the extent that alcoholics are more likely to exhibit any of the characteristics discussed in connection with acute alcohol use as potentially increasing the probability of violence, over and above the acute alcohol effects, these characteristics are relevant for explanatory models of alcoholism and violent crime. This could be the case with e.g. perceptual and cognitive attributes which were discussed in connection with a model of the escalatory process above. Gliedman (1956) and others have elaborated on the "here-and-now" character of alcoholic behavior, and experiments have shown a deterioration in abstract reasoning among alcoholics (e.g. Long and McLachlan, 1974). Some evidence of sudden mood fluctuations has been presented by Antons (1970) in referring to a number of other researchers. These factors all speak for a more random situational determination of behavior





and a greater likelihood of escalation in alcoholics both in alcohol use situations and in other situations.

### 3. Common cause models

Some evidence points towards predispositional factors of a genetic or developmental nature which could increase both the probability of prolonged excessive drinking and aggressive reaction patterns. Robins et al., (1962) conclude in their 30 year longitudinal study of children seen in a child guidance clinic in St. Louis, that "... not only is the occurrence of alcoholism highly related to evidences in childhood of pathology in the subjects, and their parents, but the kind of pathology related to alcoholism can best be described as antisocial rather than neurotic behavior." The antisocial behavior pattern in childhood can in this model (also suggested by Tinklenberg, 1973) be viewed as a symptom of genetically determined violent behavior tendencies that continue into adulthood and/or as an initial behavior pattern which, through societal and interindividual reactions, is stabilized over the lifetime of the individual. The background in both alcoholism and much of criminal behavior is often one of disturbed relationships with parents and generally poor home backgrounds (Glatt, 1965).

Guze and coworkers (1962) in a study of convicted male criminals found that 51 per cent of the alcoholics reported frequent fighting leading to trouble before the age of 18, as compared to 32 per cent of the nonalcoholics. This



finding was replicated by Guze et al., (1968), in another study which showed that 70% of the alcoholics and 40%

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of nonalcoholics had an early history of excessive fighting. Assuming that alcoholic drinking patterns were not established at a very early age and thus that the fighting behavior was independent of (excessive) alcohol use, alcoholism and violent behavior can be seen as symptoms of a common developmental or genetic cause. There is further evidence from McCord and McCord's study (1962). They found that alcoholics were significantly more likely to have exhibited unrestrained aggression as boys than were the nonalcoholics in their study, thirty-six and twelve per cent respectively. Here one should take notice of the possibility of social class differences in the backgrounds of the alcoholic and the nonalcoholic sample, which would tend to cluster both alcoholism and aggression into the same maladjustive subcultural syndrome.

Like the McCords (1962), Hagnell et al., (1973) in Sweden found an aggressive ("dangerous") subgroup of alcoholics. They suggest that the premorbid personality determines the type of alcoholic personality that emerges. De Vito et al., (1970) found that 58% of their sample of 300 male alcoholics belonged to an "acting-out-prone" group who drank alcohol to facilitate acting-out behavior. Wexberg (1951) presents evidence that alcoholics generally have low frustration tolerance even before their addiction. Environmental factors then determine the symptom that



develops from this low tolerance. It is possible from this reasoning to see low frustration level in the dual role of causing both drinking and violent behavior in the same individuals, and as a predispositional factor that in the drinking situation, combined with the effects of alcohol, further increases the probability of aggressive behavior. Flemenbaum (1974) views affective disorders of a biological origin in the same explanatory role as Wexberg sees low frustration tolerance. (The two variables may well fit into the same explanatory model, since affective disorders are characterized by low frustration tolerance.) Affective disorders may, according to Flemenbaum, manifest themselves as alcoholism or as e.g. antisocial acts and delinquency: "... socio-economical class, culture, sex, age, and individual experiential factors are very likely to determine two or more "end products" or clinical manifestations of disorders with a common biological background". Correlational evidence of an association between psychopathic personality patterns and alcoholism is evident from a number of studies (Hoff and Kryspin - Exner, 1962; Cloninger and Guze, 1970; Mader, 1972; Hagnell et al., 1973). This type of data could, however, fit any causal model.

One can, in explaining away (strictly defined) alcoholism as a causally relevant factor in violence, assume that the concomitant social factors would be influential as determinants if there is an excess of violent behavior in general in the subpopulations that alcoholics belong to. So,

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one would expect Skid Row type alcoholics to commit proportionately more violent crimes than the general population because the predictive factors of low income, physical deterioration, low levels of education and vocational skills, etc., characterize this sub-group of the alcoholic population. The clustering of individuals with negative attributes (from the society's point of view) into subcultures, is to a great extent due to societal policies and interpersonal reactions towards these individuals. Thus if individuals with alcohol problems and others with violent behavior tendencies (and individuals exhibiting both) enter the same subculture one can assume an association to occur also on the individual level. This may, among other factors occur due to the behavior norms established in such a subculture to accommodate the attributes of the members, or it may be a consequence of the greater number of frustrating stimuli encountered in such a negatively defined subculture.

In summary, we can conclude that the factors which can explain the higher prevalence of violent crime among alcoholics than among nonalcoholics are the following:

- 1) Alcoholics may have a greater risk of being apprehended by the police both because of a greater risk of acute alcohol effects at any time and because of their status as alcoholics and recidivists which generally makes them better known to the police than nonalcoholics.





- 2) Due to the higher risk of acute use of alcohol at any time alcoholics are at a higher risk of displaying violent behavior, whatever the appropriate causal models of a situational nature.
- 3) Prolonged excessive alcohol use may be connected with predispositional attributes which increase the probability of aggressive behavior in connection with acute alcohol use. We have seen some evidence to this effect in a previous section on predisposing factors.
- 4) Prolonged excessive alcohol use may also give rise to predispositional changes in the individual, which outside of any alcohol use situations, increase the probability of violent behavior. An example is brain damage especially of an epileptiform character.
- 5) Prolonged excessive alcohol use may be conjunctively connected with alcohol use patterns which also in non-alcoholics may give rise to states of the organism which increase the likelihood of aggressive behavior. Poor nutritional habits when drinking may lead to hypoglycemia and binge drinking may lead to REM-sleep deprivation. Both conditions by themselves increase the likelihood of violent behavior. In addition, there may be an interaction effect with alcohol use.
- 6) "Alcohol use" may indicate different variables for



alcoholics and non-alcoholics, so that alcoholics (at least a certain subgroup of alcoholics) display alcohol use, such as use of drinks of high alcohol or congener content which could show a comparatively strong relationship to violent behavior.

- 7). { Prolonged excessive users of alcohol may, due to developmental or genetic factors, belong to a sub-population which through a common cause, such as early childhood experiences or affective disorder, show a higher probability of antisocial behavior and among these, violent behavior.
- 8) A large proportion of excessive alcohol users are subjected to societal and interpersonal reactions. Some of these may force them into subcultures where violent behavior is condoned, expected or technically necessary for functioning within the subculture, and in relating to the larger cultural matrix.

It has been suggested above that the greater frequency of acute alcohol use can explain part of the association between alcoholism and violent crime. The reverse is true also. The clustering of alcohol use occasions to alcoholic individuals can, through the causal effects discussed in this chapter, explain part of the statistical association between alcohol use and violent crime.



p. 8                   Police records are preferable to other sources, as pointed out by Wolfgang, (1958).

p. 16                   Gelfand attributes this partly to selective reporting to the authorities since alcohol is not usually seen as a defence in civil cases (as opposed to criminal cases under which homicides fall), and thus there may be under-reporting in the records.

p. 20                   Wolfgang (1958) cites a comparatively old study by Fornasari di Verce, in which he found that crimes of violence "increase and decrease in direct ratio with the consumption of alcohol". The particulars of the study are unknown to the present author.

p. 21                   Tinklenberg (1973) has pointed out the fact that both alcohol use and violence most frequently occur among close acquaintances. Thus it is difficult to establish the role of alcohol in violence independently from the role of close inter-individual ties in studies of an epidemiological nature. In experimental methodology, these variables could be varied independently of each other. Both Wolfgang (1958) and Amir (1967) have pointed out the difficulties in establishing a null hypothesis.

p. 24                   Mayfield (1972) found that the problem drinkers in his prison sample were unlikely to have been in treatment for alcoholism and "almost never voluntarily sought treatment". This indicates that the populations tapped by prison samples may be very different from the ones reflected in clinical samples of alcoholics, and results may not be comparable.





p. 25                For an excellent discussion of different measures of "abnormal drinking", see Edwards et al., (1971).

p. 31                The null hypothesis stating that a statistical positive relationship between alcoholism and crimes of violence is due merely to chance, has to take into consideration the higher probability of alcohol use among alcoholic samples. Thus in rejecting this null hypothesis it is assumed that alcoholism and causally related and concomitant phenomena, lead to a higher risk of violent behavior than expected by chance and by the higher risk of alcohol use in alcoholics.

p. 41                Assuming that hypoglycemia is relevant in the etiology of a portion of alcohol-related violence, Pawar's (1972) findings of two hypoglycemic patients who had drunk one and a half bottles of whisky and 4 - 5 pints of beer followed by another half bottle of whisky, before committing aggressive acts, are of value in assessing the representativeness of the amounts of alcohol used in experiments on aggressiveness.

p. 42                These figures are recalculated from Shupe's (1954). Except for purely assaultive crimes, the sample sizes are fairly small and the percentages subject to large sampling fluctuations. For homicides the base used in the recalculations is 25, for purely assaultive crimes 150, for robberies 61, and for rape 21.

p. 51                Moyer (1971) has derived several different categories of aggression among animals; predatory, inter-male, fear-induced, irritable, maternal, instrumental, and aggression for territorial defence. He suggests that most of these forms of



aggression may have specific physiological centres and mechanisms in the central nervous system and particular endocrine bases. The different forms of aggressive behavior would be released by qualitatively different external cues. This is the basis for Moyer's categorization. The idea of one continuous variable of aggressive behavior would not be valid if Moyer is right, although for some purposes a one-dimensional scale could be useful. Moyer warns that "there is clearly no necessity for assuming that all of the kinds of aggression identifiable in the various animal species are necessarily identifiable in man".

p. 55                This is, of course, not denying that factors which explain differences in rates of violent behavior in subpopulations or in the same population, over time, also have explanatory value in individual cases of violence. It is only to say that these factors will have different explanatory values from one individual to the other, and for some, none at all, and that statistical analyses of aggregate figures on violence, by their very nature, leave out the most important variables in the causal chains leading to violence. They would, however, be extractable through experimental methods.

p. 59                "Relevant" here meaning e.g., situations in which participants reach a significant blood alcohol level.

p. 63                If there were positive interaction effects between these variables, the probability of violent behavior in connection with alcohol use would be greater.



p. 67                    Another possible methodological explication of a direct causal nexus between alcohol use and aggressive behavior is the following: No matter what the values of the other variables in the situation and in the individual, there will be an increased likelihood of aggressive behavior when there is alcohol use among the individuals in the situation. It should be pointed out that in these formulations the idea of a direct connection does not mean that all individuals who consume alcohol will necessarily behave aggressively. What it means is that there will always be a greater readiness (tendency) towards aggressive behavior.

p. 68                    The "le cas pur" justification seems to be implicit in much psychological research aside from any questions of availability of subjects. With university sophomores, we also have perhaps the closest possible approximation to freedom from effects of extraneous developmental factors which could be conditionally relevant in connection with all forms of behavior, including violent behavior.

p. 69                    This is probably the case since symbolic and cultural aspects of alcohol use (including "suggestion") are not at play in animal samples.

p. 78                    What will later be referred to as the formal nature of the disinhibition model is further enhanced by the fact that "alcohol", the presumed independent variable in the model, is never specified. No doubt this fact adds to the popularity of the disinhibition concept.



p. 79                The descriptive nature of the concepts used to allude to the effects of alcohol, can perhaps be brought forth by asking the question: "Why does "A" behave aggressively after drinking alcohol; is it because of disinhibition, loss of emotional restraint or loss of self-restraint?" How would we test these "alternative hypotheses"? We should perhaps not rule out the possibility that "disinhibition" as a descriptive concept, has phenomenological connotations and these are characteristic of the experiences with alcohol use. Then, however, "disinhibition" is on the same logical level as "happiness", "relaxation", etc. Compare the following questions (possibly from an interview survey): "Do you feel     a) happy,   b) relaxed,   c) disinhibited,     after a few drinks?"

p. 85                Explanations by suitably labeled properties are one of the most primitive forms of explanation and often of a tautological nature. Experimentalists certainly do not commit this fallacy. The loose way in which the concept (as explanation) often is used makes one suspect that nonempirical treatises on the subject have fallen prey to this logical and linguistic fallacy. For a deservedly celebrated account of this type of "explanation", see Gilbert Ryle's "The Concept of Mind" (1960).

p. 87                This is probably connected with the fact that it is essentially defined negatively as behavior which is against existing norms. Perhaps it can also be explicated as referring to extreme behavior without closer specification of the variable on which it is extreme. (This is true for another central concept used in describing human behavior: deviance.)





p. 89                Since Shoham et al., (1974), are interested in explaining violent behavior in general, it would be possible to include alcohol among the situational factors, although they do not do so. In view of the relationship between alcohol use and violent behavior their standpoint would be stronger had they done so.

p. 96                A basic problem is that the situational factors may have become phenomenologically quite different in alcohol conditions as opposed to non-alcohol conditions. If we look for variables and identity criteria in the "phenomenological universe", then we do not have the same set of conditions and the situations are not comparable quantitatively.

p. 105              Hopwood and Milner (1940), comment on the three homicide offenders in their sample of 96 violent offenders who were involved with alcohol: "Crimes committed by persons suffering from delirium tremens are usually homicidal in character, and are often connected with terrifying visual hallucinations. Although relatively rare, it is probable that homicidal crime is more frequent in delirium tremens than in any other of the common confusional states and toxic deliria..."

p. 117              Hartocollis, however, suggests that the extreme reactions of loquaciousness, gregariousness, aggression and elation may be the outcome of an effort of his subjects "to cope with a generally challenging situation."

p. 122              Shoham et al., (1974), have pointed out the importance of a study of factors linked to the avoidance of violence in order to arrive at a satisfactory explanation of the phenomenon.



It is clear that conditional factors of a cultural nature exist, and that an explanation is unsatisfactory if it only looks at situational factors or tries to project everything onto a simple "disinhibition" paradigm. The existence of relevant cultural factors has been emphasized by Epstein and Taylor (1967), within the frustration-aggression model: "It is self-evident that all cultures must counteract any tendency for a simple, direct relationship to exist between frustration and aggression."

p. 123                Heath (1958), found it noteworthy that the Camba pattern of drinking did not lead to hallucinations among the participants. It is possible that this may have a causal connection with the consensual cues provided in the drinking situation. Perhaps ritualization in the drinking situation would also tend to decrease individual interpretations of hallucinatory perceptions possibly connected with sleep deprivation and withdrawal. This would be especially true of cultures where hallucinations are seen as having religious significance.

p. 124                One would probably learn a great deal from many other safeguards which have been instituted in different cultures to counteract the more or less random distribution ~~on~~ situational and motivational variables which could jeopardize the culturally defined "success" of a drinking situation, e.g., through violence.

p. 138                It is noted among experimental psychologists that cultural factors greatly modify reactions to frustrating stimuli. The simple frustration-aggression paradigm is seen as insufficient by Epstein and Taylor (1967): "...the circumstances that arouse



an individual to anger, no less than those that determine whether he will act on the anger, are culturally determined, and neither bears an invariant relationship to frustration." They also state that a fruitful area for further research would be a study of conditions and individuals to find out which of these would be determined by learned social attitudes rather than by the experience of frustration.

p. 146                "Alcoholism" will here be understood to include the long-term stable consequences of prolonged alcohol use on the physical, psychological, behavioral and social state of the individual, and not defined exclusively as an underlying pathology or as a symptom of such a pathology.

p. 151                If alcoholics have a stronger predisposition to become hypoglycemic after ingestion of alcohol than do non-alcoholics (which Moynihan, 1965, seems to suggest), it could explain the predisposing role of alcoholism towards aggression in alcohol use situations, which was discussed in a previous section.





TABLE 1

The alcohol involvement in various violent crimes in Finland, 1904-13 and 1920-29, in percent (from Verkko, 1951).

	Intoxicated at the time			Had drunk during the day				
	Offender		Victim	Offender		Victim		
	1904-13	1920-29	1904-13	1904-13	1920-29	1904-13	1920-29	
Murders	7.1	7.3	1.4	2.4	9.0	14.1	1.9	2.4
Intentional manslaughter and wounding occasioning death	58.7	62.1	44.8	49.5	11.3	14.9	11.0	12.9
Wounding resulting in grievous bodily harm	63.9	66.9	36.1	38.7	9.3	13.2	8.1	13.6
Assault and battery with ensuing death or grievous bodily harm	74.1	53.4	43.1	41.7	6.9	13.5	13.8	15.9



TABLE 2

The alcohol involvement in various violent crimes in Vyborg County, Finland, 1920-1929  
(from Verkkö, 1951)

	Murder		Intentional manslaughter		Assaults resulting in grievous bodily harm		Assault and battery with ensuing death or grievous bodily harm	
	N		N		N		N	
Victim	0	0	74	15.3%	21	8.8%	3	
Offender	6	10.3%	109	22.5%	81	33.9%	7	
Both	1	1.7%	185	38.1%	84	35.1%	9	
Neither	51	87.9%	117	24.1%	53	22.2%	8	
Total	58	100 %	485	100 %	239	100 %	27	



TABLE 3

Percent of Persons Arrested in Each Crime Class Showing Various Percentages  
of Urine Alcohol (Shupe, 1954).

	Cases studied	nil	ALCOHOL CONCENTRATION					
			.00- .09%	.10- .19%	.20- .29%	.30 .39%	.40 plus	.10% plus
Rape	42	50%	5%	19%	21%	5%	0%	45%
Felonious Assault	64	52%	5%	9%	20%	13%	2%	43%
Cutting	40	8%	5%	20%	35%	25%	8%	88%
Concealed Weapons	48	8%	8%	21%	25%	33%	4%	83%
Other Assaults	60	8%	13%	25%	33%	18%	2%	78%
Murder	30	17%	17%	30%	23%	13%	0%	67%
Shooting	33	18%	3%	27%	33%	18%	0%	79%
Robbery	85	28%	12%	15%	29%	15%	0%	60%
Burglary	181	29%	7%	24%	24%	14%	2%	64%
Larceny	141	27%	9%	13%	27%	19%	5%	65%
Auto Theft	138	30%	11%	25%	22%	8%	4%	59%
Forgery	20	40%	0%	20%	20%	20%	0%	60%
Average total	882	27.3%	8.4%	20.2%	25.8%	15.6%	2.6%	



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